Handbook of Common Cattle Diseases & Breeding Management

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Knowledge is Our Business

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By Robert Jennings, Shakuli Saxena

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CHAPTER 1

EXPLORING THE DAIRY CATTLE HEALTH MANAGEMENT TRAINING

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ABSTRACT:

The Dairy Cattle Health Management Training Manual serves as a comprehensive resource for dairy farmers and industry professionals seeking to enhance their knowledge and skills in the field of dairy cattle health management. This manual encompasses a wide range of topics, from the basics of cattle health and welfare to advanced disease prevention and treatment strategies. It provides valuable insights into the best practices and protocols for maintaining the health and productivity of dairy cattle, ultimately contributing to the sustainability and profitability of dairy operations.Throughout this manual, readers will find in-depth information on cattle anatomy, common diseases, vaccination schedules, nutrition management, and reproductive health. It also emphasizes the importance of record-keeping, early disease detection, and effective communication with veterinarians. The manual integrates practical advice, case studies, and hands-on training exercises to ensure that learners can apply their knowledge in real-world situations.As the dairy industry continues to evolve and face new challenges, the Dairy Cattle Health Management Training Manual equips individuals with the necessary tools and knowledge to meet these challenges head-on. By promoting proactive health management and the well-being of dairy cattle, this manual supports the industry's sustainability goals and the delivery of safe, nutritious dairy products to consumers.

KEYWORDS:

Bovine, Cattle, Disease, Health, Herd, Management.

INTRODUCTION

For both urban and rural Ethiopian populations, the dairy cow business is becoming the primary source of food and revenue. It is significant economically, particularly in rural regions. However, there are several limitations that impact the dairy cattle extension system, such as a lack of feed, an unstandardized housing system, poor genetics, and the need of a regular health management package. These limitations will be covered in this handbook.One of the key elements affecting the growth of the dairy cow business in Ethiopia is health management. It is one of the key elements in preserving ideal milk production, maintaining regular calving intervals, and assuring the next generation by taking care of and lowering mortality in calves and other young dairy livestock. This manual has been written as a resource for farm extension workers to assist dairy cattle farmers with the most common health issues that are frequently encountered at the dairy farm level by providing knowledge and teaching fundamental skills on identifying and resolving dairy cattle health problems. This manual is not intended to describe all dairy cattle diseases[1], [2].

In dairy cow feed management and dairy cattle fertility management guides, it is noted that appropriate nutritional supply, housing, genetic improvement, and diligent follow-up are the foundations of successful dairy health management techniques. Regular health care practices should be used to prevent health issues in dairy cattle. It's critical to identify any health concerns with the dairy cattle herd as a whole and then with individual cows in particular.

This may be achieved by paying close attention to the animals, getting close to them, smelling them, or even listening to their noises. These are crucial details for spotting health issues in the herd and swiftly taking the necessary measures. Infectious disorders, diseases of the reproductive system, diseases of the digestive system, metabolic diseases, and parasite diseases are the most prevalent dairy cow diseases covered in this handbook[3], [4].

Virus and Infections

Anthrax is a bacterial illness transmitted through soil that may be acute, subacute, or pervasive in animals. Exudation of black, tarry blood from natural orifices is one of its defining features. It is a zoonotic illness that is lethal and causes significant economic damage in both people and animals. By going through sporulation, the bacteria may endure for a very long time and serve as an infection source.

Clinical Symptoms

Animals might pass away unexpectedly and without any symptoms in acute cases. In acute and subacute instances, it is common to see high temperature tremors, depression, convulsions, respiratory distress, abdominal oedema, bloody milk, rumen atony, and miscarriage.

Transmission

Neither animals nor people commonly get anthrax from one another. Upon coming into contact with oxygen, the bacteria release spores. Extremely resilient, these spores may last for years in soil or on the wool or hair of affected animals. They may then germinate and spread illness if they are consumed or breathed by an animal, or if they get inside via skin incisions.Insects may transfer the germs to other animals because the blood of infected animals sometimes fails to clot and may leak from body orifices. Typically, spores found in feed or the soil cause animals to get sick[5], [6].

Control and prevention

1. Implementing routine immunization regimens depending on the local anthrax season

2. It's crucial to dispose of deceased animals properly; the carcass shouldn't be opened since doing so would cause germs to grow spores when exposed to air.

3.The property must be placed under quarantine until all animals at risk have received vaccinations, and

4. Carcasses must be properly disposed of, ideally by burning or alternatively by deep burial with quick lime.

5. Pest and rodent management, as well as cleaning and disinfecting, are essential.

Using the proper antibiotics to treat ill animals; potential hazards to the public's health

Three unique forms of anthrax manifestation in humans exist. The most typical kind is a skin illness brought on by contact with spore-containing animals or animal products. When butchers or livestock producers work with ill animals or when an infection has been transferred through wool or skins, several things may happen. The spores enter the body via skin wounds or scratches and start a local infection that, if left untreated, might become systemic. When the spores are consumed, the digesting form develops. Tragically, those who lose their animals may also perish while attempting to save anything or consume the flesh of a deceased animal. Inhalation is maybe the most dangerous method. Since spores on hides or

hair might be breathed, this condition has been referred to as "wool sorters disease." It is obvious that stopping the sickness in animals would safeguard the public's health.

Clinical symptoms

one of the limbs swelling, usually around the shoulder on strong muscle. On probing of the afflicted regions in the hip, shoulder, chest, back, neck, or elsewhere, a distinctive oedematous and crepitating sound may be heard. You may notice febrileness, inappetance, a rough coat, sadness, lameness, etc.

Control and prevention

Bovines are susceptible to the extremely infectious bacterial illness known as pneumonic pasteurellosis, which is characterized by pleurisy and bronchitis. When cattle are packed together, inhalation is the main route of infection. Transmission occurs via direct contact between infected and susceptible animals through contaminated aerosols from breathed air.

Clinical symptoms

Excessive nasal discharge, a rapid increase in body temperature, the lack of rumination, elongation of the head and neck, open mouth breathing with grunting, coughing, and sneezing are the main clinical symptoms[7], [8].

Control and prevention

1. Never combine animals from unreliable sources.

2. Prevent situations of stress

3. Suitable ventilation

4. Consistent immunization

5. Antibiotics are used to treat ill animals based on the underlying ailment.

6. In cases of parasite pneumonia: wide-range anthelmintic;

Foot and mouth condition

A highly contagious viral ailment that affects cattle, pigs, shoat, buffalo, and artiodactyl fauna, foot and mouth disease is characterized by fever, vesicles in the mouth, on the snout, gums, throat, teat, and interdigital cleft. Both direct touch and milk consumption might spread it. Recovered animals may carry the virus for up to 2.5 years.

DISCUSSION

The most typical symptoms are drooling and vesicles on the nares, in the buccal cavity, and between the claws. Clinical symptoms include dullness, lack of appetite, fever, trembling and kicking of the feet, animal abortion in pregnancy, and calf mortality.

Control and prevention

1. Vaccination
2. Test and isolate
3. supporting action
4. Lumps on the Skin

Lumpy skin disease, a highly contagious viral illness that affects cattle and buffalo, is characterized by intracutaneous hard nodules that resemble pox, limb edema, enlargement of the superficial lymph nodes, and lymphangitis.

Clinical symptoms

Swelling those hurts, fever, lacrimation in the nose, and hyper salvation are symptoms that are followed by the distinctive eruption on the skin and other regions of the body, enlarged lymph nodes, and secondary infection that causes suppuration and sloughing[8], [9].

Control and prevention

Vaccination: sustaining care for secondary infection.

Tuberculosis

Mycobacterium, an infectious, granulomatous bacteria, is the cause of tuberculosis in both humans and animals.

Transfer and extension

Contact with domestic and wild animals that have the sickness may transmit it. The most common way to get an illness is via breathing infectious droplets that are coughed out of the lungs. Consuming raw milk from sick cows may potentially infect people and calves. Because the illness progresses slowly and might take months or years to kill an infected animal, one animal can infect a large number of other members of its herd before showing any clinical symptoms. Therefore, contact with sick wild animals and migration of undiscovered diseased domestic animals are the main means of disease transmission.

Clinical symptoms

Emaciation, weakened state, anorexia, varying temperature, persistent cough, breathing problems, and enlargement of lymph nodes

Prevention and management

1. Keep the herd unharmed by testing and killing reactors

2. Bringing milk to a boil before consuming

3. Routine examination of meat

4. Conditions Affecting Newborns

Neonatal mortality and newborn diseases are the main causes of financial loss in dairy farms in particular and animal production in general. Fetal illness and postpartum illnesses brought on by septicemic, enteric, and respiratory infections are the main causes of calve mortality in dairy cattle.

General Guidelines for Newborn Care

To reduce the danger of infection, the newborn should be maintained in a clean environment. Up until the newborn is ready to live separately and independently, systemic supportive care should be given to preserve haemostasis. To identify indicators of degradation and enable early treatment, the bodily system should undergo regular, thorough inspection. To avoid secondary infections or to fight off any that may be present, precautions should be taken to ensure passive immunity.It is important to assess the effectiveness of passive immunity transmission.

Reproductive System Illnesses

The main reproductive system disorders in dairy cow covered in this guidebook are Bovine Mastitis, Brucellosis, Trhichomoniasis, Vibrio, Leptospirosis, Cystic ovarian disorders, prolonged corpus luteam, postponed ovulation, retained placenta, dystocia, and metritis are among the illnesses that may affect women.

Mastitis is an inflammation of the udder or mammary gland that is nearly often brought on by a bacterial or mycotic pathogen infection. Inflammation is detectable Redness, swelling, heat, and pain are the four characteristics that may be used to identify inflammation. The udder tissue is harmed by the bacterial inflammation that results from mastitis. Toxins and dead tissue generated during inflammation have a negative impact on the animal's body. Damage to blood vessels promotes increased blood flow to the afflicted region, intensifying the redness and expanding the affected area. The buildup of fluids and blood does this, resulting in a painful swelling.The bacteria that cause mastitis may be present and dwell almost everywhere on dairy farms, including on the manure, the floor, the skin of calves, and the hands of milkers. These microbes may thrive and multiply in filthy, warm, moist settings that have a plenty of food and water.

Mastitis-predisposing factors

Poor sanitary management is the most significant factor raising the risk of mastitis. The likelihood of infection increases with the number of germs present. Other causes of mastitis include the following. Mastitis will spread more readily in cattle with high milk production. They have longer milking times and more active udder tissue. As a result, the teat canal remains open for longer. High milk production is also linked to higher energy requirements, which might reduce infection resistance.

Inadequate Milking Methods

By damaging the teat and teat canal during forceful milking, germs are more likely to enter the udder. Another reason why germs multiply is incomplete milking.Lack of cleaning tools, the milker's hands, and the udder all contribute to unhygienic milking practices.

Lackluster housing system:

Lack of a clean floor and resting areas increases the risk of developing mastitis since it takes around 20 minutes after milking for the teat canal to completely shut.

Teat bruising and sores:

This could be because to many causes that cause would to develop on the teat.contamination of the dairy cattle's living space by harmful bacteria that might penetrate the teat and result in mastitis.

Spreading of mastitis

The lowest portion of the udder, the teat canal, comes readily in touch with sources of bacterial contamination, such as the milker's hand, the cow's skin, dirt on the cow's skin, the ground the cow is standing or resting on, and the milking pail.According to the infection's stage and intensity, there are;According to acute mastitis, there is swelling, heat, discomfort, abnormal secretion, and fever in addition to depressive symptoms, weakness, and a total lack of appetite.Acute/subacute mastitis: Comparable to per acute mastitis, but with milder to moderate manifestations of fever, lack of appetite, depression, systemic alterations, and glandular changes.

Subclinical mastitis

The inflammatory response is only detected by testing; the milk won't alter in appearance, but the taste will shift from sweet to salty. The most obvious and often first indicator of mastitis is defined by changes in the milk, such as the presence of flakes and lumps, a change in milk's color from creamy yellow or blueish to watery, the presence of blood cloths in the milk, and a pink appearance.

Techniques for Detecting Mastitis

The strip cup features a cup and a black enameled plate. Check for lumps, flakes, and rags after milking the first three spades of milk from each quadrant on the plate. Following testing, keep the milk in the cup and dispose of it hygienically.

Test for California Mastitis

CMT is used to assess the severity of subclinical mastitis in the udder. It counts the number of dead cells present in the milk. Due to the udder's normal ongoing renewal process and the production of milk, there are always dead cells in the milk. Under these circumstances, the number of dead cells per milliliter of milk is low and stays below 100,000, undetectable by CMT. The number of cells per milliliter of milk grows beyond 250,000 when there is a subclinical illness, and alterations may be seen with CMT.

Test for California Mastitis

In order to provide the appropriate antibiotic medication, it is crucial to determine the precise causal agent by laboratory examination of milk samples.

How to sample milk for laboratory analysis:

Use cotton gauze or, if that is not possible, a clean cloth soaked in alcohol to first clean the teats. Apply latex gloves. If none are available, use detergents to wash your hands. After using the first three scoops of milk, pour the remaining milk into a sample container. This lessens the chance that germs from the area surrounding and within the teat canal may contaminate the milk.

Once the milk has been tasted, immediately shut the bottle.

Mark the sample vial with a distinct identifier. Use the cow's name or identification card to indicate where quarter the sample came from (for example, just behind, etc.). Bring the milk to the lab and properly store it there. If the first therapy is unsuccessful, freezing is advised for further laboratory testing.Prevention and management strategies for mastitis preventative actions

Step 1: Inspect the milking machinery.

The milking equipment has to be dry and spotless. Buckets should ideally be kept upside down in the sun so that the inside is dry and doesn't provide the ideal environment for bacterial growth.

Step 2Clean the barn in

Less germs will be present the cleaner the barn is. Avoid damp barns, maintain it clean, and dry to minimize bacterial breeding grounds.

Step 3: Handwashing and drying

A milker's hands come into contact with a variety of bacteria-contaminated things often. Therefore, it's crucial to always dry their hands after washing them and to properly reduce bacterial contamination.Before beginning to milk, wash and dry the skin surrounding the udder and teats.

To get rid of contaminating bacteria, this is crucial. A dry paper towel will do after the animal is clearly clean.

Step 4: Examine the first milk.

Check to see whether the cow has mastitis infection using a strip cup.

Step 6: Drain the udder of milk.

To maintain the health of the teat, proper milking methods are essential. Complete milking must be performed delicately to protect the teats. 'Full hand' milking is another crucial method.

Step 7: Dip the teat

Bacteria may be eliminated while the teat canal is still open by cleaning the teat after milking. Commonly, this is accomplished by dipping immediately after milking with an iodine solution in a dip cup. By doing this, the teats are shielded from microorganisms entering the teat canal.

Step 8: Continue to stand the cow.

The teat canal needs some time to completely shut. A cow lying down at this time on a filthy floor might give germs an opportunity to reach the teat canal. Maintaining standing livestock, such as by giving them new feed, may lower the chance of mastitis infection[10], [11].

Step 9: Scrub the milking apparatus.

It's crucial to clean the milking equipment to prevent bacterial infection.

CONCLUSION

In conclusion, for dairy farmers, industry experts, and anyone else concerned in the care of dairy cattle, the Dairy Cattle Health Management Training Manual is an essential tool. The information and abilities covered in this handbook are crucial given the rising demand for premium dairy products and the growing awareness of animal welfare and sustainability. This guidebook not only improves the health and wellbeing of dairy cattle but also helps to ensure the financial sustainability of dairy operations by placing an emphasis on preventative measures, early illness identification, and solid management techniques. It emphasizes how important ongoing education and training are to preserving dairy herd health and the long-term viability of the dairy business.

The Dairy Cattle Health Management Training Manual serves as a guiding light of direction and information as we advance in the changing world of dairy farming. It equips people with the knowledge and skills they need to make wise choices, adjust to changing conditions, and ultimately succeed in the dynamic field of dairy cow health management. Our aim is that this guidebook will remain a useful tool for enhancing the welfare, output, and general performance of dairy companies.

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CHAPTER 2

ANALYZING THE PUBLIC HEALTH RISKS OF BRUCELLOSIS

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ABSTRACT:
Brucellosis, a zoonotic bacterial infection caused by various Brucella species, poses significant public health risks worldwide. This abstract highlight key aspects of the public health risks associated with brucellosis. The disease primarily affects livestock, such as cattle, goats, sheep, and pigs, but can also infect humans, leading to a range of debilitating symptoms. Transmission occurs through direct contact with infected animals or their products, consumption of contaminated dairy products, or inhalation of airborne particles.Brucellosis has the potential to cause substantial economic losses in the agricultural sector, disrupt food supply chains, and burden healthcare systems. Furthermore, the chronic nature of the disease in humans, with symptoms ranging from fever and joint pain to severe complications like endocarditis, underscores the importance of prevention, early diagnosis, and effective treatment.This abstract serves as a reminder of the need for vigilance in managing and preventing brucellosis. It highlights the importance of One Health approaches that bridge the gap between human and animal health, promoting awareness, surveillance, and control measures to mitigate the public health risks posed by this insidious pathogen.

KEYWORDS:

Brucellosis, Contagious, Disease, Infection, Public Health.

INTRODUCTION

The udder of the cow is cleaned out of germs and dead cells by milking her as often as possible, ideally every two hours; at least three times a day. The greatest and most crucial approach for rinsing out the illness is this one.The teats of the mastitis-affected cows should be cleaned and sterilized with disinfectants such alcohol after milking.Direct infusion of the specific antibiotic tubes designed to treat mastitis into the mammary gland twice daily for three days in a row. Consult your veterinarian for further therapies, like as antibiotic injections or pain relievers, if you suspect a systemic illness. For information on the time periods for withdrawal from veterinary medications for use in dairy cattle, see the manufacturer's literature[1], [2].

Intra-Ammary Medications

Ovarian Cystic Disease

Cows with cystic ovarian disease often exhibit symptoms during the first two months after calving. It mainly happens between 30 and 60 days after calving, during the postpartum period, when normal ovarian function normally recovers.The main indicators include mounting other cows, nymphomania (permanent estrus behavior), hyperestrogenization less milk being produced, no signs of heat in the cow intrapetrous interval that is too lengthy, Anoestrus[3], [4].

Treatment for Ovarian Cyst Disease

The repair of factors including dietary and metabolic problems and hormonal imbalances that contribute to the development of the ailment is addressed in modern therapy for cattle.

Continuous corpus luteum

The lack of heat and pregnancy are symptoms of the corpus luteum's functional disruption, which results from its continued presence on the ovary beyond day 20. Pyometra, uterine infections, excessive milk production, particularly in the early postpartum period, extended glucocorticoid therapy, high levels of concentrated feed, obesity or emaciation, dystocia, retention of the fetal membrane, uterine distention, and decreased endocrine activity.

Clinical symptoms

There are no heat indications at all.

Treatment

Elimination of all risk factors is more important than uterine and ovarian massage, vitamin, and hormone treatment. Luteolytic dosages of PGF2 are given together with a dose of GnRh analogue around 48–56 hours later to encourage ovulation.

Prevention:

To address the issue as soon as possible, it is advised to do a rectal examination on anestrus cows after 50–60 days following parturition and at 15–18 months of age.

Cattle's Delayed Ovulation

Negative energy balance, heat stress, specific illnesses including infectious bronchitis and viral diarrhea in cattle, and subluteal progesterone levels are the causes.

Stopping delayed ovulation

In connection to the service, it is crucial to guarantee a timely ovulation. A acceptable conception rate may be attained by ensuring that ovulation occurs 7–18 hours following AI. GnRH administration continues even while AI is in use.Infantilism is a syndrome defined by functional disruption in heifers that are physiologically developing or by underdeveloped reproductive organs in young heifers. It may be brought on by insufficient care for unwell young people, debility circumstances, and isolation from stimulants that are opposite sex[5], [6].

Control and prevention

It may be accomplished by careful management of young heifers and expert veterinary treatment of young animals with diseases. allowing unrestricted exercise, massage, and teaser bull, as well as stimulating the reproductive organs.Abortion is the removal of a live baby from the uterus before it reaches a viable age or the removal of a dead fetus of detectable size at any stage of pregnancy. Abortion may have infectious or non-infectious causes. Abortion may also be brought on by acidosis, hypoxia, and heat stress. Rarely, severe trauma may result in abortion. Infectious diseases are the main factors behind abortion[7], [8].

Abortion Abstinence

1. Adequate hygiene and biosecurity controls in the surroundings and feed storage for cows

2. Separating lactating cows and removing any abortion-related items right away

3. Systematic testing for mycotoxins and other phytotoxins in the feed

4. Adequate protection from infectious illnesses that might cause abortions

5. Upkeep of sufficient breeding and treatment data to prevent sexing pregnant cows and giving them abortion-causing medications.

6. A nutritious diet that is well-rounded

7. Genetic selection and an effective method of record keeping

not removing the fetal membranes within 12 to 24 hours after calving. Retained fetal membranes are more common in cases of abortion, stillbirth, twin birth, dystocia, inducement of parturition with PGF2alpha, metabolic problems, particularly milk fever and high ambient temperature, advanced cow age, preterm delivery, placentitis, and nutritional disruption. Through bacterial growth and immune system compromise, it puts cows at risk for acute puerperium metritis and postpartum endometritis.

Clinical symptoms

After 24 hours, macerating and discolored tissue is seen hanging from the vulva. There may sometimes be foul-smelling discharge, lethargy, and reduced milk production. Infection throughout the whole body is uncommon. To determine if the membrane has detached, non-drug treatments such daily moderate traction of the membrane are advised. the immediate postpartum injection of PGF2alpha, oxytocin, calcium, and antimicrobial therapy are examples of drug treatments. Prepartum care should focus on preventing retained placenta.

Vibriosis

An infectious bacterial condition of the genital canal called vibriosis in cattle may impair fertility and sometimes result in abortions. It is a venereal illness that infected bulls pass on to vulnerable cows and heifers when they mate. A new infection will spread quickly during breeding in a herd that has not been exposed to it or had no vaccinations. Since most cattle recover within a year, vibriosis is mostly self-limiting. However, disease carriers are widespread, and fresh infections may spread to animals that haven't been exposed.

Clinical symptoms

The three main clinical symptoms in women are infertility, irregular menstrual cycles, and early embryonic demise.

Strategies for prevention and control

For semen production and reproduction, only bulls free of infection should be utilized. Antibiotic treatment of the semen lowers the possibility of disease transmission through AI. The sickness is preventable with a vaccination.

Trichomoniasis

Cattle have a venereal illness called trichomoniasis that results in infertility, protracted breeding, irregular abortions, and early embryonic mortality. It is brought on by a tiny motile protozoan that can only be found in the reproductive tracts of cows and bulls. During breeding, it is introduced into the cow's uterus from the bull and moves up to infect the uterus.

Medical symptoms:

Low conception rate, excessive vulvar discharge, early abortion, and pyometraan buildup of pus in the uterusare the main clinical symptoms.

Control and prevention

There are no immunizations available to prevent it, although virgin bulls and artificial insemination may help manage it. The primary carriers of trichomoniasis are bulls, who once infected carry the infection for life while exhibiting no symptoms of the illness.

Treatment

Animals with diseases need to be killed

Leptospirosis

It is a contagious illness brought on by the bacteria leptospirainterrogans, which is spread by contact with mucous membranes or skin as well as consumption of tainted food, drink, or urine.

Clinical symptoms

Fever, anemia, insatiability, and high mortality are examples of clinical indicators in acute form in calves; in chronic form in adults, abortion, stillbirth, weak infected calves, and kidney failure are examples of clinical signs. lower milk production and blood in the milk, milk's test for bitterness.

Control and prevention

1. Strict sanitary procedures must be followed.

2. Steer clear of rodents.

3. All new animals must be quarantined before being integrated into the herd.

Vaccination Treatment Tetracycline, streptomycin, and combinations of streptomycin and ampicillin may be used to treat sick animals.

Brucellosis

A bacterial infection called brucellosis mostly affects dairy cattle. It is a dangerous illness that affects both people and animals, posing a risk to human health. Animals with the condition often have abortions or reproductive problems. After the first miscarriage, animals usually recover and are able to produce live offspring, although they may continue to release the germs. Contaminated feed and water, discharges of aborted animals, fetal membranes, insemination of infected bull's semen, and ingestion of unpasteurized milk all contribute to infection.

DISCUSSION

Due to its high human contagiousness, brucellosis is a zoonosis that may cause undulant fever, sometimes known as Malta fever since it was first identified in Malta in the 1850s. Human symptoms include sporadic or intermittent fever, headache, weakness, excessive perspiration, chills, weight loss, and general aches and pains. Organ infections, such as those of the liver and spleen, may also happen. Working with diseased animals, aborted fetuses, or placentae puts veterinarians, farmers, and slaughterhouse staff at risk for infection. People may get the illness by consuming unpasteurized milk made from affected animals[9], [10].

Control & Prevention

1. Proper disposal of fetal remains

2. Cleaning up a hazardous area

3. Testing and culling of animals that test positive.

5. No effective therapy

Dystocia

Animals with dystocia have a tough time giving birth. Myometrial defects, metabolic abnormalities like hypocalcaemia, fetal oversize, physical and anatomical immaturity of the mother, abnormal presentation of the fetus, inability to induce labor due to inadequate nutrition, insufficient dilation of the birth canal, fetal hormone deficiency, fetal death, and other ad hoc causes are some of the causes.

Endometritis and arthritides

It is an inflammation of the uterus's endometrial and muscular layers. dystocia, a retained placenta, and reproductive system damage. Metritis is predisposed by abortion, concomitant systemic infection, and filthy circumstances during parturition.

Clinical symptoms

The typical clinical symptoms of metritis include fetid uterine discharge, systemic symptoms including fever, anorexia, and sadness, as well as an enlarged and friable uterus.

Control and prevention

Strict hygienic standards before giving birth employing antibiotics and hormones like PGF2alpha to treat ill animals.

Uterine and vaginal prolapses

The main medical conditions that dairy cattle experience are uterine and vaginal prolapses. During the latter trimester of pregnancy, mature cows have vaginal prolapse. It is linked to rumen distention and a larger uterus in pregnancy. Similar to this, fetal membrane hypocalcaemia, excessive traction to relieve dystocia, and recumbence with the hindquarters lower than the forequarters are contributing causes to uterine prolapse.

Treatment

Get assistance by reporting to the local animal health facility.

Digestive System Illnesses

Typical indigestion

Accumulation of indigestible feed un the rumen is a defining feature of simple dyspepsia. It is brought on by abrupt feed changes, such as adding urea to a diet, moving cattle to a lush pasture rich in cereal grains, or giving cattle a high-level grain ration, all of which may produce excessive fermentation and impair rumen function during 24 to 48 hours. Additionally, unexpected dietary changes from low to high concentration, the provision of frozen feed, and the impact of cold or chilled water on the usual microflora in the rumen are all potential causes of simple indigestion.

Symptoms of mild indigestion

Appetite loss that ranges from partial to total, decreased milk production, decreased rumen motility, and rumen that is full, hard, and doughy. However, normal levels of body heat, respiration, and heart rate are present.

Control and prevention

Avoid giving animals unusual diets; instead, introduce high-grain diets gradually. Medications like Epson salt, magnesium sulphate, and saline purgatives are used to treat ill patients in order to enhance rumen motility.

Bloat

Bloat is an over-dilation of the rumen and reticulum with fermentation-related gases, either in the form of free-gas separated from the ingesta or in the form of persistent foam mixed with the ruminal contents. owing to gas buildup, whether or not feed material was consumed.

Bloat comes in two different forms:

Irregular gas eructation is caused by oesophageal blockage, less activity, and extended recumbency.

Clinical symptoms

The left flank is distended, the belly is swollen, there is pain, mouth breathing is difficult, the head is extended, the tongue is protruding, and the rumen is no longer motile.

Control and prevention

Before feeding plants with a high leguminous content to cattle, they should wilt. Before moving into a pasture containing leguminous plants, feed animals with hay. progressively acclimate to high performance ratio

Bloating treatment: in foamy bloat

For big cows, provide 250–300 ml of vegetable oil or an equivalent quantity of detergent via oral emulsion in water. Oral polyxalanes 25–50 gm. Use a trocar and cannula at the left flank behind the last rib or perform an emergency rumenotomy.

Overload of grains/rumen acidosis

Acute ruminant sickness known as grain overload causes dyspepsia, rumen stasis, dehydration, acidosis, toxemia, and coordination problems in addition to collapse and usually death. It happens when animals unintentionally get access to significant amounts of easily digestible carbohydrates, especially grains. When concentrates are fed in large quantities at once, the natural rumen microbiota is impacted, which causes rumen acidosis. This interferes with the rumen's ability to absorb important meal elements.

Clinical Symptoms

The animal's body temperature is typically below average, but if it is exposed to hot temperatures, it may rise to >40 0C. Breathing is shallow and quick, and in extreme cases, the rumen's contents may feel solid and doughy. Sudden drops in milk output and milk fat content are other warning signs.

CONCLUSION

With far-reaching effects on both human and animal populations, brucellosis is still a serious public health issue. This bacterial illness, which may spread from cattle to people, highlights how intertwined health is under the One Health concept. In order to address the hazards that brucellosis poses to the public health, prevention is essential. This entails putting in place efficient animal immunization programs, encouraging appropriate agricultural practices to minimize human exposure, and enhancing diagnostic capabilities for quick identification and treatment of affected people. Public education initiatives are also necessary to inform vulnerable groups about the dangers of ingesting raw dairy products or handling diseased animals. In conclusion, reducing the hazards of brucellosis to the public's health requires a coordinated effort from a number of industries, including agriculture, veterinary medicine, and human healthcare. In addition to lowering the burden of this illness, collaboration and a One Health strategy are essential for avoiding its recurrence in areas where it has been contained. We can strive toward a better and safer future for both people and animals by thoroughly addressing the problems caused by brucellosis.

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CHAPTER 3

PREVENTION AND CONTROL FROM PARASITIC INFESTATION

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ABSTRACT:
Parasitic infestations are a pervasive global health concern, affecting millions of individuals and animals each year. This abstract provides an overview of strategies for the prevention and control of parasitic infestations in both human and animal populations. It highlights the importance of proactive measures, including public health interventions, veterinary care, and education, in reducing the burden of parasitic diseases.Effective prevention and control strategies encompass a range of approaches, from improved sanitation and hygiene practices to the development of vaccines and anthelmintic treatments. The integration of these methods within a One Health framework, which considers the interconnectedness of human and animal health, is crucial for addressing the complex challenges posed by parasitic infestations.By implementing comprehensive, evidence-based strategies, we can significantly reduce the prevalence and impact of parasitic infestations, improving the health and well-being of both humans and animals. This abstract serves as a call to action, emphasizing the importance of continued research, collaboration, and investment in parasitic disease control efforts.

KEYWORDS:

Helminths, Infestation, Parasites, Parasitic, Protozoa.

INTRODUCTION

To prevent the acaricide from being washed away during rain, keep sprayed cows indoors. The sensitivity and kind of ticks determine the best acaricide to use. Using medication by pouring it on has two benefits. Gradually adjust to high performance ratio. preventing animals from eating grains, and ensuring that the meal contains at least 10% roughage If the condition is not serious, treatments including surgical operations to extract the contents and hydration therapy should start; otherwise, the animal must be put to death[1], [2].

Laminitis

This illness is connected to rumen acidosis. Certain chemicals move into the blood as a result of rumen disturbances, causing the laminae in the hoof to expand. The pressure inside the hooves as a result of the swelling gives the cow pain and suffering. This painful gait causes the hooves to develop excessively, which results in laminitis.Regular hoof trimming with the right tools may prevent laminitis.

Traumatic Reticuloperitonitis

It happens when the reticulum is pierced by sharp foreign objects like nails or wire, which causes the peritoneum to inflame and adhere. The item may sometimes be able to pass through the diaphragm and enter the thoracic cavity, where it may lead to pleuritis, pneumonia, myocarditis, and endocarditis[3], [4].

Clinical symptoms

Reticulorum atony, apprehension while moving, an arched back, a cautious walk, laying down or getting up, and moaning when stepping over obstacles are all symptoms.

Treatment

Supportive treatment with intravenous and oral fluids and antibiotics. surgery performed by a qualified surgeon. Dairy Cattle Metabolic Illnesses Metabolic illnesses in dairy cattle are brought on by physiological changes in the cow brought on by an unbalanced feed supply. They are typical in dairy cows with subpar food management.

Dairy Fever

A metabolic disorder known as milk fever affects mature, high-lactating cows and is brought on by a lack of calcium, which is necessary for muscular contraction. The illness might develop 12 hours before to calving, during calving, or even 24 to 48 hours thereafter. The condition is marked by generalized muscular weakness, circulatory collapse, and depression and is brought on by hypocalcaemia. Dystocia, retained placenta, and uterine prolapse are all complications of the illness. Calcium deficiency is linked to increased calcium production in colostrums, reduced calcium absorption, and, correspondingly, calcium mobilization from the gut and bones.

Clinical Symptoms

Depression, loss of awareness, dry mouth, chilly ear, pupil that may be dilated, muscular tremor, teeth grinding, subnormal body temperature, loss of muscle tone, circulatory collapse, sterna recumbency with bending of the neck, drowsy appearance, and flaccid paralysis are some of the symptoms that may be present.

Control and prevention

During the last stages of pregnancy, provide more phosphorus and less calcium. Calcium chloride 120-150 ml should be given orally 24 hours before claving. Provide a balanced feed to the cow when she is pregnant.

Treatment:

Around, 100–200 grams of calcium borogluconate in 400–800 ml of solution, or calcium borogluconate 25–30% solution

Ketosis

A metabolic disorder that affects heavy lactation cows is ketosis. It often happens during the first six weeks of breastfeeding and is marked by weight loss, pica, inappetance, reduced milk production, and neurological abnormalities. It happens when milk production is at its highest and more energy is required. Low levels of glycogen due to high milk production cause ketosis, a state of negative energy balance.

Infestation with Parasites

By causing irritation, pain, and blood feeding, external parasites like ticks, lice, fleas, and mange mites have a significant negative impact on animals. In dairy cattle, parasitesboth external and internalare major causes of illness. As a result, the handbook addresses the following significant interior and exterior parasite infections.

The animals' skin is directly harmed by ticks. Ticks can serve as intermediate hosts for a number of illnesses that affect animals. They are necessary blood-feeding parasites. Through blood feeding, they spread illnesses including theleriosis, Anaplasmosis, Babesiosis, and Cawdriosis. Breeds of exotic cattle are more resistant to illnesses spread by ticks. Therefore, frequent tick infestation management techniques are advised, particularly in tropical and subtropical regions where there are dairy farms. There are four phases of development for ticks. It's an egg, a larva, a nymph, and an adult. The larvae, nymphs, and adults will all eat animals throughout various life stages. From shrubs, tall grasses, pastures, and grazing areas, ticks infest cattle.

Control Controls for Tick Infestation

Tick prevention is influenced by local factors such as tick occurrence, farm health management, breed of cattle, rainfall, etc. Set up a tick prevention campaign in accordance with professional guidance. To reduce the chance of contracting an illness carried by ticks, keep the animals inside the home. Cleaning animal buildings will also help the farm have fewer ticks. In grazing systems, pasture management with double fencing guards against tick infection in livestock through interaction with nearby wildlife or neighbors. Tick load is reduced by burning dry pastures and trimming shrubs. The use of barb wire next to hedges will prevent livestock from ingesting ticks from such hedges. The tick pressure may be reduced by creating healthy pastures with many parcels, frequent mowing, etc. In places with a high tick frequency, particularly during the rainy season, use an acaricide once per week.

It acts for a lengthy amount of time. Environmental contamination is lower there. But it is expensive.While frequent tick-spraying is advised in open grazing systems, zero grazing systems do not need tick treatment. Read the manufacturer's handbook for instructions on how to prepare the proper quantity of concentration to apply in order to utilize accaricides effectively. To prevent direct contact and inhalation of the acaricide, put on the proper protective clothing. When spraying, make sure the cow is thoroughly coated. Make sure the spraying apparatus is working properly and that the acaricide gets to the skin without sticking to the hair's outer layer.

Parasite Invasion within the Body

There are many different types of internal parasites that infect cattle and cause illnesses that reduce dairy cow's output. This booklet covers the principal internal parasites of dairy cattle, including liver flukes, lung worms, and stomach/intestinal parasites. Cattle grazing polluted pastures might get infected with internal parasites. Infected livestock grazing in the pasture might contaminate it. When calves are infected, it usually happens when they are grazing alongside adult cattle and eating hay or cut grass from contaminated pastures. To stop the spread of infection, it is crucial to understand the life cycle of worms. Different organs in the body of the animal, such as the liver, lungs, or intestines, are affected by worm infestation. They cause severe diarrhea by damaging the intestinal wall and interfering with meal breakdown and absorption. Because liver fluke larvae may spend a lot of time in intermediary host snails, the situation is more complex. This makes fluke prevention more challenging.

DISCUSSION

Cattle's intestines are home to worms that lay eggs. Eggs develop into larvae and are expelled with the excrement. Cattle consume the larvae, which are found on the leaves of grass. In the cow's gut, larvae grow into worms that produce eggs. This may cause serious damage to the intestines, rendering sick calves and cattle incapable of properly digesting food[5], [6].

Chest worms

Lungworms have a somewhat different life cycle than intestinal parasites. The mature worms lay eggs and dwell in the animal's lungs. Larvae are ejected via feces after hatching from eggs. The fungus that are dwelling on the dung assist the larvae move throughout the pasture by climbing on top of them. The larvae will go from the intestines to the lungs after being eaten by the cow.

liver parasites

The life cycle of the liver fluke is more complex and includes an intermediary host. Animal liver tissue is the home of adult liver flukes. They lay eggs, which are then developed into miracidium and expelled in the animal's feces. Snails consume these larvae, which grow into cercaria and are then expelled by the snails. Animals will ingest the cercaria that are present on grass and transport them to the liver.To prevent young animals from contaminating the grazing field with worm larvae, paddoking and rotational grazing are adviseddestroying marshy regions by fencing them off or drying up the intermediary hosts of worms. Ponds should not be used for drinking water; instead, use boreholes or swift-moving streams. Keep animals out of marshy regions and, where required, employ dukes for biological control. Feed uncontaminated fodder and use a zero grazing regime. Create silage to keep larvae away. Avoid grazing dairy cows and young stock together on the same pasture. The danger of infection will be reduced by cutting the grass. Every three months, frequent deworming is advised while grazing on dangerous or diseased soil. Trichlabendazole and Levamisole are the drugs of choice for treating liver fluke infections. In a zero grazing system, rotational grazing system deformation and grazing on non-infected land are not required[7], [8].

General Guidelines for Managing Farm Health

A consistent immunization program is essential for managing a dairy farm healthily. In the majority of instances, a second vaccine is required soon after the first one. It is referred to as a booster. To maintain the degree of protection against infectious agents, the immunization must be administered again after a certain amount of time, often a year. Consultation with a veterinarian is essential when creating an efficient immunization program. This is crucial to control the likelihood of illness on the farm, the cost and accessibility of vaccinations, the immunization schedule, and the vaccine's efficacy. Anthrax, Blackleg, Lumpy Skin Disease, Bovine Pasteurellosis, Food and Mouth Disease, and Contagious Bovine Disease are among the vaccinations often administered to dairy cattle in Ethiopia. Pneumonia in pleuropenumonia.

Managing the health of dairy cattle Training recommendations

The EDGET Project's Working Packages, which were introduced by SNV Ethiopia, include this module. Increasing awareness of "commercial farming" among small-scale dairy farms is one of the goals of the EDGET initiative. The information and abilities necessary to distinguish between a healthy and unwell cow will be acquired by the EDGET Project extension workers with the aid of this module. Basic details on prevalent illnesses affecting dairy farms will be provided, along with helpful tips on how to manage and, where feasible, avoid these illnesses.

Management of the health of the dairy industry is crucial for effective production and reproduction. It comprises of normal day-to-day monitoring of each farm animal. Hazards are present all around the farm, endangering animal health. Bacteria may cause infections and other inflammations, which are frequent on dairy farms and are found everywhere on a farm.

Ticks may be a source of vector-borne illnesses, which pose a significant risk to cattle, particularly in East Africa. Inadequate nutrition may cause metabolic problems in addition to having a direct impact on milk production and development. To get the greatest economic outcomes, each farm must manage cattle illnesses and their effects in the most effective manner possible.The EDGET Project requires that extension staff be able to counsel small-holder farmers on the best ways to manage their crops and animals, notably the dairy industry. To create action plans for accomplishing these goals and to create monitoring and evaluation tools, the farmer must first decide what the goals of his or her dairy business[9], [10].

In your role as an extension worker, you should be able to assess the health condition on a dairy farm and advise a dairy farmer on how to avoid illnesses common to dairy cattle, such as mastitis, diseases transmitted by ticks, infectious diseases, parasite infestations, and metabolic disorders. Additionally, you may advise a farmer on what to do when problems with the health of cattle occur on a farm. If there are health issues on a farm, you should be prepared to advise the dairy farmer when and if it is essential to visit a veterinarian or another specialist. They will work with the farmer as a partner to talk about the health problems they both face and to help them as they decide how to enhance farm management in order to address or control the problem with the health of the cattle.Although the full variety of cattle diseases cannot be covered in this course, the following diseases will be covered: mastitis, tick-borne illnesses, parasite infestations, and metabolic disorders. The training also focused on illness prevention, including immunization as well as good sanitary practices and feed management.

The identification and interpretation of the indicators of dairy cow health problems will get special focus. A sick cow has to be attended to and treated right away if they are lying down, unable to stand, inappetent, or have chilly ears. In addition to being identified as early illness problems, rough coat rapid decrease in milk supply, lack of rumination, and irregular gait are utilized to initiate therapy sooner.

Cobb Quality Control

Cobb is dedicated to providing disease-free livestock to all of its customers worldwide and is aware of its obligations to safeguard its premier breeding flocks, which are a vital component of the global supply chain for parent and grandparent breeders. To do this, we have created and managed extensive biosecurity programs based on tried-and-true principles of global best practices. Cobb has extensive written biosecurity and training programs in place. Important elements include a prohibition on any Cobb employees owning or having contact with non-Cobb avian species, a shower-in procedure for anyone entering a Cobb farm or hatchery, footwear and hand sanitization controls at the entrance to every poultry house, and a footwear change procedure for anyone entering housing with Cobb breeding stock. In addition to these initiatives, steps are taken to reduce the dangers connected with staff moves.

Feed and water supplies to Cobb chickens are also subject to extensive controls and limits. To reduce the danger of illness incursion, Cobb farms regulate and sterilize all equipment and supplies before use. In order to maintain virulent Newcastle-free status for our breeding operations in the United States, United Kingdom, Netherlands, and Brazil, Cobb has achieved compartmentalization certification for avian influenza. This accomplishment demonstrates our dedication to a higher standard of biosecurity and a product free from illness. Through a rigorous approach that completely conforms with regional testing and regulatory standards for our breeder flocks in all nations where Cobb keeps breeding stock, the efficacy of our methods is continuously checked. The testing is being done by accredited and recognized

regional labs. Using both traditional methods and antigen-based technologies, all Cobb flocks are tested for avian influenza, M. gallisepticum, M. synoviae, and Salmonella at least once every three weeks. Additionally, management from the Production Department and independent auditors from the Quality Assurance Department routinely evaluate all facilities and procedures for biosecurity.

In all facets of broiler and broiler breeder production, the Cobb dedication to genetic enhancement of our range of products continues to raise the performance potential. However, it is crucial that the flock manager has a sound management program if they are to achieve both genetic potential and consistent flock output. The Cobb broiler breeder's success on a global scale has contributed significantly to our understanding of the breed in a variety of situations, including hot and cold regions, controlled environments, and open housing. The goal of this Breeder Management Guide is to help you create a management plan that will optimize the genetic potential of Cobb products in your area. The flock's fundamental requirements must be met, but management must also modify the program to take full use of the breed's potential. Some of the recommendations may need to be modified locally to account for your particular expertise or infrastructure and to enable you to adhere to any applicable national standards for animal welfare or care. Your organization will get assistance from Cobb's local technical service and global technical support teams in applying the suggestions.

Critical elements that are most likely to have an impact on flock success are highlighted in the Cobb Breeder Management Handbook. This is a component of our technical information offering, which also contains a wide variety of performance statistics and guides for the Cobb Hatchery, Processing, Vaccination, and Broiler Management. Our suggestions are supported by up-to-date scientific understanding and global real-world experience. The management approach you decide to use may be influenced by local laws, so you should be aware of them. This Cobb Breeder Management Guide is designed to serve as a resource and a complement to your own flock management abilities so that you may use your expertise and good judgment to regularly produce positive outcomes with the Cobb line of products.Every action taken by the breeding stock caregiver must be covered by biosecurity. At the hatchery, feed mill, farm operations, general maintenance, and by employees, procedures to avoid the entrance and spread of illness or contamination must be put into place. Any problem might jeopardize the flock's overall health and production as well as the whole biosecurity program. The biosecurity program's relevance must be understood by all employees. The following are fundamental for biosecurity: Avian Pathogen Control Program

To certify that chicken flocks are free of illness and to aid in the prevention and control of avian diseases, several nations maintain national poultry health programs. US Department of Agriculture National Poultry Improvement Program, UK Poultry Health Scheme, and Brazil PNSA are a few examples of these national poultry health initiatives. National poultry health programs often contain biosecurity requirements as well as a framework approach to tracking, preventing, and managing these main poultry infections. The pathogens Mycoplasma gallisepticum, Mycoplasma synoviae, Salmonella pullorum, Salmonella gallinarum, Salmonella enteritidis, Salmonella typhimurium, Newcastle disease, and avian influenza are often included in a national poultry health program for flocks of chickens. The following elements should be considered when creating a pathogen control program for your business or joining a national avian health program to assist assure compliance and illness prevention:

Concrete floors are the best kind for thorough cleaning and sanitization.

The flocks should only be regularly accessible to farm staff. Personnel from the farm should only go to flocks they are in charge of. Lock up every home to prevent intrusion by strangers. On-site documentation of all new employees or visitors should be recorded in a logbook. It is absolutely forbidden to interact with chickens outside of the farm, including at feed stores, zoos, fairs, wet markets, or exhibits. Personnel should notify a management if they come into touch with a bird unintentionally, and they should stay away from the farm. All workers should wash and change clothing between trips to various units within a farm. We highly advocate a minimum of 72-hours of "no bird contact" for any inadvertent bird encounter before staff return to a producing facility to minimize disease transmission. A flock should be placed under rigorous quarantine and visited last if it is determined to be questionable or positive. Each residence requires the wearing of a particular pair of shoes. For flock supervisors and visitors, a full pair of fresh protective clothes and footwear must be given. At each entrance to the chicken house and each airspace, there should be hand washing stations. Prior to the actual footwear change, there should be antiseptic foot pans or boot scrubbers at all entries into each chicken house. Team members with digestive problems should notify management right away before working with poultry or poultry feed since people have the ability to transmit certain varieties of Salmonella to poultry. To prevent multi-age flocks, farms should operate in a "all-in, all-out" fashion wherever feasible. To guarantee that the health state of the flock is optimal on large farms with multi-age flocks, each sector or designated zone of the farm should have particular biosecurity criteria, and flocks inside each house should be "all-in, all-out."

Samples should be taken on a regular basis to check on the flock's health, as directed by the corporate veterinarian and the national chicken health program. For health monitoring to accurately determine the absence of pathogens within the flock, the kind of sample, the number of samples needed, and the frequency of samples must all be defined. It's crucial to have a trustworthy lab that can do accurate tests for salmonella and avian illnesses.In order to stop the spread of the infection and protect the health of other flocks, urgent biosecurity measures should be imposed on the home or farm if tests reveal a suspect or proven case of the illness. To confirm the illness in the suspected home and to establish the absence of disease in other buildings on the farm, more diagnostic samples must be acquired.

CONCLUSION

For the sake of world health, parasite infestation prevention and management are crucial. This extensive task needs a diversified strategy that includes both human and animal health concerns. The development of efficient vaccines and treatments, the transmission of educational materials to at-risk groups, and the promotion of good sanitation and hygiene practices are important measures.

The key to effectively combating parasite infestations is the One Health concept, which acknowledges the connection of human and animal health. Achieving long-term control over these illnesses requires cooperation between medical experts, veterinarians, researchers, legislators, and communities. In conclusion, despite the fact that parasite infestations continue to be a problem, major advancements may be achieved with ongoing dedication to preventative and control measures. We can lessen the burden of parasitic illnesses, ameliorate suffering, and improve the general health and well-being of communities across the globe by giving priority to research, surveillance, and the implementation of evidence-based therapies.

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CHAPTER 4

AN OVERVIEW ON RODENT AND INSECT CONTROL

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ABSTRACT:

Rodent and insect control is a critical aspect of public health and agricultural management. This abstract provides an overview of the importance of controlling rodent and insect populations and outlines key strategies and methods for effective management. Rodents and insects pose various threats, including disease transmission, damage to crops and structures, and food contamination. Integrated pest management (IPM) approaches, which combine chemical, biological, and cultural control methods, are essential for sustainable and environmentally responsible pest control.Effective rodent and insect control requires ongoing monitoring, early intervention, and a comprehensive understanding of pest biology and behavior. Additionally, community engagement and education are essential components of successful pest management programs, promoting awareness and encouraging responsible practicescontrolling rodents and insects is crucial for safeguarding public health, preserving agricultural yields, and protecting structures and resources. By implementing IPM strategies, fostering collaboration between stakeholders, and prioritizing education and awareness, we can achieve sustainable and effective control of these pests.

KEYWORDS:

Insect, Pest, Rodent, Prevention, Treatment, Infestation.

INTRODUCTION

A vaccination program's goals are to safeguard future generations, reduce disease-related deaths, and develop immunity. Schedule immunizations to prevent financial loss by being aware that age might affect how the body reacts to the vaccine. Pay close attention to animal welfare practices to reduce stress since vaccination is a necessary stress. In every region of the globe, it is impossible to provide a precise immunization schedule for chickens. For a program that addresses the disease threat and vaccination accessibility in your region, speak with your poultry veterinarian. For a summary of current immunization practices, see the Cobb immunization Guide[1], [2].

Medication

The greatest and most effective way to control illness is, by far, prevention. The greatest method of prevention is to put in place an efficient biosecurity policy that includes the right vaccinations. However, if flock disease signs are present, it is crucial to get skilled veterinarian advice as soon as possible. Drugs and antibiotics are expensive, and they may muddle a disease's symptoms, making a diagnosis more difficult. To effectively treat a condition, the right drug should be used at the right time. When used to treat another ailment, a medicine that is favoured for treating one disease may cause damage. It's possible that some illnesses don't have effective treatments or that treating them wouldn't be financially viable. As a result, send 6 to 8 live birds exhibiting the usual symptoms to a lab so that sensitivity testing may be done to determine which drugs will be successful against the disease agent.

Water Supplies

Water mains and municipal water sources may not be accessible to many farms because of their location. The most biosecure water for poultry is water obtained from municipal mains since it has often been treated and sterilized. High quantities of bacteria have sometimes been found in municipal water systems as a result of occurrences like torrential downpours, broken pipes, or ground water seeping into the system. As a result, producers should conduct routine water testing to verify minimum water quality criteria. Producers should treat their water systems to prevent biofilm and other accumulation even when the water is cleaned at the source.

Remember that certain water authorities may restrict the amount of water that is accessible based on the flow rates from the water main. In the case of excessive demand, producers should be aware of any restrictions and have access to extra water storage.Water from wells and the earth - The quality of well water is often determined by geography. There is extremely little danger of bird diseases present. But run-off situations and torrential downpours may pollute these water sources with pathogens like E. coli. Groundwater problems related to salinity and excessive mineral concentration should be addressed by routine testing and treatment. Sometimes the supply of water varies according to the season, necessitating the pumping of water into storage tanks. Close these storage tanks, and have the water routinely checked for contaminants.

Surface water

Sources of bird infections, such as bird Influenza, are more likely to be found in surface water, which includes lakes, streams, ponds, and rivers. Never utilize these water sources to provide water to chicken farms since they are habitats for ducks.

Different water sources

Determine the principal source in order to assess the biosecurity risk of alternate water sources. For instance, water transported by truck from a municipal water supply has to be hygienic. To make sure that it wasn't polluted during truck filling or by other horizontal touch, including human movements, the water should be analyzed.

Rodent Prevention

Humans and animals have been known to get illnesses from rats. Salmonella, cholera, and many other infectious diseases may be spread by them. They may also hurt or kill birds and harm electrical cable, insulation, drapes, hoses, and other items. Rodents may enter via practically any opening, including cracks in doors, holes in walls, and gaps around pipes. Rats and mice can fit through openings as tiny as 12 mm, and mice can fit through openings as small as 6 mm. The chicken house, bedding storage, and feed storage spaces should not be tolerated for rodent activity. A number of methods that limit shelter, food, and water are necessary for an efficient rodent control program, and they should be regularly applied. The methods listed below are crucial for controlling rodents.

Insect Management

Due to decreased productivity and the spread of illnesses, pests may result in severe production losses. Some insects have the physical capacity to harm buildings physically, including their structural integrity. Numerous bug species may have an influence on breeding activities, but flies, beetles, and ants are the main culprits. Due to the abundance of food, water, and shelter in poultry facilities, insects are drawn there. Because insects are becoming

increasingly resistant to different pesticides, chemical insecticides are not always effective. An insect control program should include mechanical ways of control as an alternative. However, the best methods to stop pest infestations are via solid management techniques and a preventative program[3], [4].

Experts from reputable pest control businesses are able to quickly assess problems and contribute to the creation of a successful pest management strategy. Once it is in place, excellent record keeping is a useful tool for spotting and addressing pest problems before they develop into infestation problems.If there is a problem with darkling beetles, treat the litter with an efficient pesticide and keep it indoors for at least one day. Once the birds depart the home, a large number of beetles will emerge, thus control must happen immediately. Cover the litter once it has been collected to keep insects out and to keep others in check until it can be removed from the farm.

Chemical regulation

The selection of a pesticide should take into account the pest it is intended to control, its efficacy, any possible risks, and local laws. More information on the ideal chemicals for your company may be obtained from a qualified pest control specialist. Products with carbaryl as an ingredient may be used to manage certain insect species. By preventing the acetylcholinesterase enzyme from functioning, they obstruct the neurological system.

Products with pyrethrin as an ingredient may be used safely in homes with birds. Ants, flies, and beetles cannot survive these substances. Beetles may manufacture enzymes that detoxify the toxin, but they only temporarily paralyze the affected area. Pyrethrins may be more powerful when used in conjunction with other pesticides. There are other insect development regulators that stop the production of chitin so that the larvae do not develop into adult beetles. Insecticides may be sprayed around the home perimeter if any ant trails can be spotted traveling from mounds outside to inside the house. Chemical insecticides may also be used to treat any ant mounds[5], [6].

Mechanical Management

There are many different kinds of traps, such as pheromone, sticky tape, and electrically powered traps. Fans may be placed near entrances to deter flies from entering since they won't move in the direction of the breeze.

Biological Defense

For pest management, a variety of biological control agents are available. Be aware that not every environment calls for the usage of every one of these substances. To manage beetles and flies, boric acid may be used as a pellet or crystal, however it should only be used in areas between flocks since it might harm animals. There are certain fungi that may infect and destroy insect larvae. Fly pupae may be killed by fly parasitoids, which are small wasps. Be mindful that many chemical pesticides may harm both pest and beneficial species if you use beneficial insects. Ants typically eat other insects for food. Therefore, preventing bug infestations may help avoid ant infestations.

DISCUSSION

Ectoparasites may be quite problematic in chicken breeding operations because they feed on the exterior of the body. Ectoparasites may increase the quantity of floor eggs because hens avoid entering infested nests. Ectoparasites may also result in skin lesions, which can then

become infected and harbor and transmit illnesses. Ectoparasites may be prevented and controlled with a strong cleanliness program and the use of certain insecticides.

Several different types of mites affect poultry. Typically, the Northern Fowl mite is found around the vent. As a result, they are often discovered on eggs and may be found by employees who handle eggs. The legs, feet, and base of the feathers are infested with scaly leg and depluming mites, respectively. Some mites can survive away from birds for many weeks if environmental circumstances are favorable. Consequently, mites may persist even during a lull to infect a fresh flock. On young birds and during cooler months, infestations often become worse. Known mite carriers in the wild include birds. Prevent wild birds from building nests near or on poultry buildings. Equipment and egg flats have the potential to bring mites into the home. They spend the day hiding out in cracks and crevices, nest boxes, and walls, and they eat at night. Infestations may result in pale combs and wattles, crusty skin on the legs, and birds plucking off their feathers, depending on the species that is infested[7], [8].

Lice

Lice do not ingest blood; instead, they nibble on skin. Only to attack another bird, lice must leave the bird they are living on. The mite-control and -prevention methods are the same. The whole bird should be examined since lice won't preferentially infest one area of the body. The simplest approach to spot a lice infestation is by looking for white egg masses at the base of the feathers.

bedbug

Mite behavior is comparable to that of bed bugs. They spend the day hiding in cracks and crevices and eat at night. A bed bug problem won't go away with a period of downtime since bed bugs can live without birds for months. Search for bedbugs, which will show as black dots in cracks and crevices and on eggs.

Ticks and fleas

Breeder operations sometimes include these parasites. Fleas and ticks may often be controlled using the same insecticides that are used to treat other ectoparasites.

worms within the body

Worms and protozoa are the two primary types of internal parasites that affect pullets and breeders. Nematodes and cestodes, two taxonomic groups with worms as members, are the most prevalent worms that affect poultry. The most significant roundworms are nematodes, which include Ascaridiagalli, Heterakisgallinarum, and Capillaria spp. The most significant tapeworms are cestodes, which comprise the species Raillietina spp. and Davainea spp.

Worm eggs may be consumed directly, or sick earthworms can carry eggs or host larvae that have not fully matured. The blackhead parasite, which may cause flock mortality rates of up to 15%, is carried by the cecal worm eggs, which can survive for months in the environment. Older birds may get cestodes. Snails and beetles may serve as an intermediary host, making pest control a crucial component of parasite management[9], [10].In intensive systems, where tapeworms are difficult to cure, control may be more readily attained by focusing on the intermediate hosts. During raising, the prophylactic deworming regimen should be carried out. The level of field difficulty should inform the plan. Compared to flocks put on dirt floors, flocks placed on concrete floors will have less difficulties. Find the best course of action for your circumstances by consulting a local veterinarian.

Worming via Food

During growout, a 7-day course of Fenbendazole, Flubendazole, and Mebendazole is beneficial.

Worm Removal from Water

Two separate administrations of the product spaced 10 to 14 days apart should be used for each deworming treatment. Each application ought to take three to four hours. The first treatment at 8 and 10 weeks of age and the second therapy at 19 to 21 weeks of age are advised under low challenge settings. Under challenging circumstances, the method can include up to four distinct therapies. Example: Three and five weeks of age, followed by eight and ten weeks, a third treatment at fourteen to sixteen weeks, and the last one at nineteen and twenty-one weeks. A successful program depends on the deworming product used. Use a broad-spectrum medication that can handle worms of all types and stages. Although there are numerous different dewormers, only a select number are capable of treating worms of various species and developmental stages. The majority of worms that infect poultry and their various phases are successfully treated with the active component Levamisole hydrochloride at a dose of 40 mg/kg. It can only be given out while growing, however.

Preventing coccidiosis

The flock's immunity development is the aim of the coccidiosis program. Cocci medications, such as amprolium, should only be used when necessary since they have the potential to deactivate built-up immunity and cause coccidiosis or necrotic enteritis outbreaks in the future.

There are two crucial phases in the preventative program:

1. Immunization. During the first five days after birth, birds may get vaccinations. At the hatchery, spray vaccination offers a more regulated and efficient technique.

2. The farm's control of litter. Transfer litter from the brooding area and combine it with the litter in the new space when you offer the birds extra room inside the home. This process must be followed throughout the first three to four weeks so that the chicks may finish the necessary oocyst cycling for immunization by consuming the vaccine from the litter.

Important considerations for spray cabinet immunization against coccidiosis:

To keep the oocysts in suspension, coccidiosis vaccinations must be regularly swirled or gently agitated. The actual oocyst dosage supplied will vary significantly if oocysts are allowed to sink to the bottom of the bottle. In contrast to respiratory vaccinations, which are often sprayed in a cone form, coccidiosis vaccines are typically administered in a fan pattern. The amount of vaccine administered by coccidiosis vaccines—which use bigger droplet sizes—is around 21 ml each box.

In order to promote preening after immunization and vaccine ingestion, the reconstituted vaccine is colored. The chick boxes should be put in a location with enough light after vaccination to continue encouraging preening, which stimulates vaccine intake.The secret to successful parenting is a management approach that is efficient from chick placement forward. The facilities and equipment must be ready to accept the chicks before chick placement. Every home has to be cleaned and disinfected. It is important to perform all microbiological monitoring and validation tests prior to placement to provide the laboratory

adequate time to analyse the samples and provide findings. to learn more about sanitizing, cleaning, and keeping an eye on microbes in the home.

Getting foreign breeding stock:

To guarantee the swift clearance of the chicks from customs, team members must be knowledgeable of the importation processes, paperwork, and any additional national or local regulations.

Vehicles leaving the customs facility or airport must be spotless, hygienic, and climate-controlled. To guarantee effective customs clearance and the timely loading of day-old chicks for transportation and placement at the raising farm, coordinate transportation schedules, keep an eye on airplane arrivals, and monitor the arrival of the chick truck at the airport.

Farm receiving breeding stock:

To guarantee that the necessary number of people are ready and waiting before the truck comes so that the chicks may be deposited as soon as possible, alert the farm workers. If there isn't a full-time security guard at the biosecurity gate, make plans for someone to be there to let the vehicle through. If there is a security guard at the gate, make sure the guard is informed that the truck will be arriving. To receive the package, the member of the technical support team must be present.

Equipment Inspections

Checks for minimal ventilation

As soon as the preheating process starts, the minimum ventilation should be turned on to get rid of any waste gases and extra moisture. To stop drafts from harming the chicks, plug air leaks. Before inserting the chicks, check the carbon dioxide level. Always keep CO2 levels around 3000 ppm.

Checks of the air's ambient temperature

Temperature transmission and air relative humidity both have an impact on temperature perception. if the air is dry and the relative humidity is low Because of the low percentage of transfer, greater dry bulb temperatures should be employed, as shown in the chart to the right. If chemicals are used during the cleaning and disinfection stage before the chicks are placed, there has to be enough ventilation to remove the residue and supply the chicks with clean air.The provision of a constant housing environment that is tailored to the demands of the birds is the key to enhancing avian performance and welfare results. This is particularly important for young birds, as they need a constant floor and ambient temperature to encourage healthy movement and proper behavior. The amount of heat needed depends on the outside temperature, the insulation of the roof, and how well the home is sealed. Check to make sure all heaters are working at their highest output and are mounted at the proper height. Before preheating starts, heaters need to be inspected and maintained. The most effective radiant brooders are often those that are combined with forced air heaters. Forced air heaters are utilized as auxiliary heat sources in cold weather, whereas radiant brooders are employed as the principal heat source during brooding. Birds become able to control their internal body temperature as the flock becomes older. Forced air heaters may start serving as the main source of heat at about 14 days of life, but they should only be used in solid, well-insulated homes. Insufficiently insulated homes should utilize radiant-type heaters as their main source of heat.

Spot and radiant brooders

To establish floor and litter heating patterns within the home, either conventional pancake brooders or radiant brooder systems are employed. These mechanisms enable the chicks to explore the brood chamber and locate their preferred environment. Water and food should be accessible near to this heat source.

Flooring Heating

Hot water circulates via pipes in a concrete floor to power this system. The litter and the brooding space are warmed by the heat exchange occurring within the floor.

Warmers With Forced Air

These heaters must be positioned in the center of the home or another area with slow enough air circulation to allow for optimal air heating. These heaters should be positioned between 1.4 and 1.5 meters above the ground, where they won't expose the chicks to drafts. Since forced air heaters cannot heat air that is flowing quickly, they should never be installed close to the air intake. Heaters installed at the inlets will increase energy consumption and expense.

CONCLUSION

The complicated task of controlling insects and rodents has important ramifications for agriculture, public health, and general quality of life. Effective control strategies are essential due to the difficulties these pests provide, which include anything from disease transmission to financial losses. Rodent and insect control is now addressed holistically and sustainably using integrated pest management (IPM). IPM successfully manages populations while minimizing the negative effects of pest management on the environment by using a variety of tactics, including chemical, biological, and cultural techniques. Furthermore, it is crucial to act quickly, keep a close eye on things, and comprehend how pests behave. The effectiveness of rodent and insect control initiatives depends critically on community engagement and education. It is possible for people and communities to participate in pest control initiatives by increasing knowledge of the dangers posed by pests and encouraging proper pest management techniques. In conclusion, a mix of scientific understanding, doable tactics, and community involvement are needed for successful rodent and insect control. We can lessen the harmful effects of pests and create healthier, more sustainable settings for both people and ecosystems by implementing integrated pest control strategies and encouraging cooperation among stakeholders.

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CHAPTER 5

A COMPREHENSIVE REVIEW OF BROODING DESIGN AND MANAGEMENT

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ABSTRACT:

Brooding design and management are integral aspects of poultry production, significantly impacting the health, growth, and overall performance of young chicks. This abstract provides an overview of the importance of thoughtful brooding design and management practices, emphasizing their critical role in ensuring the welfare and productivity of poultry flocks.Effective brooding begins with careful planning and design, encompassing considerations such as temperature control, lighting, ventilation, and biosecurity. Maintaining appropriate environmental conditions during the critical early weeks of a chick's life is essential for minimizing stress, preventing disease, and optimizing growth. Proper brooding also involves the provision of suitable bedding, feed, and water to meet the specific needs of young chicks.Continuous monitoring and adjustment of brooding conditions, along with proactive disease prevention measures, are key components of successful brooding management. Additionally, this abstract underscore the significance of training and education for poultry farmers and workers to ensure the consistent implementation of best practices.

KEYWORDS:

Brooders, Brooding, Chicks, Heat, Lighting, Management.

INTRODUCTION

When placing chicks, concrete/litter temperatures are often recorded rapidly in a few random locations, which is not a realistic representation of the consistency of concrete/litter temperatures. The most effective method is to take measurements every 6 meters along the chicken house's length and in three rows across its breadth. Prior to placing the chicks, this will assist detect hot or cold zones in the home. Before each placement, the temperature of the litter should be noted. This will make it easier to assess the success of preheating and make any required modifications for subsequent installations.A minimum of 24 hours before to installation, homes should be warmed to stabilize the floor and ambient temperatures and humidity. Preheating has to start at least 48 hours before chick placement in order to meet the aforementioned goals. Preheating times vary from farm to farm and are based on factors such as housing insulation, heating capability, and climate. Concrete should be between 28 and 30 °C in temperature. Never let the temperature of concrete get over 32 °C. Litter temperatures should be heated by forced air to 30 to 32 °C at installation. When using brooder stoves or radiant heaters, the floor should be 40.5 °C beneath the heat source. When measured at a distance of at least 1 m from the center of the radiant heater or brooder stove, floor temperatures should range from 30 to a maximum of 32 °C. Feed intake falls at 32 °C and eventually quits at 35 °C. The temperature differential between the front and rear of the reception area shouldn't be more than 0.20 oC. By continuously mixing the air, recirculation fans may help maintain uniform temperatures[1], [2].

Temperature Probe Measurements

Placed all about the home, equally spaced, at bird height. Placement away from the heating source is advised. Thermostats and temperature sensors need to be calibrated at least once a year, or more often if accuracy is in question.Thermostat should be positioned close to minimum and maximum thermometers.Daily temperature readings must not differ from the mean by more than 2 degrees Celsius in a 24-hour period.

Alcohol Checks

Allow 40 chicks per nipple for partial home brooding. Allow between 8 and 10 birds per nipple once the home is completely open. Allow 75 birds per drinker for bell drinkers. The chicks may not be able to get the water because the lip of certain bell drinker designs is too high. In this situation, more drinkers will be required.To get rid of any remaining sanitizer, flush each drinker. Water has to be pure and recent. Adjust the pressure to leave a single, non-dripping water drop on each nipple. Look for any particular pressure setting advice from the manufacturer. Look out for air locks and water leaks[3], [4].

Make sure the nipple drinkers at the front desk are eye level with the women. After two days, adjust the lines so the chicks' necks are only slightly extended for drinking. Provide 1 additional drinker per 100 chicks if necessary. To preserve water quality, additional drinkers should be positioned just above the trash, but not too high to restrict access. For instance, on top of an egg flat or box lid. Additionally, they must to be put near to the main source. Before placing the chicks, do a bacteriological investigation of the water to evaluate the efficacy of the cleaning and disinfection procedure. Every day, check the sanitizer level at the end of the loops.Run the feeding system before placing the chicks to find any small difficulties and fix them.Make sure the feed distribution lines are level and secured by inspecting them.As directed by the manufacturer, lubricate chain feeder systems. Check the chain tension and look for any foreign items that might become stuck and cause harm to the system in the line. Make sure feed hoppers are dry, spotless, and prepared for filling. Feeder height should be taken into consideration. Feeders should first be placed at ground level where the chicks may readily get them.Before placing the flock, calibrate the scales that will be used to weigh the feed. In order to avoid overfeeding or underfeeding the flock, accurate feed weighing is essential.

Maintenance

Massive losses may be caused by disastrous equipment breakdowns. Regular, planned, and preventive maintenance should be a part of a thorough farm plan to avoid equipment breakdowns. To avoid delays in maintenance, replacement and spare parts should be accessible at every farm. Regular inspections, common on-site repairs, and significant maintenance issues that need scheduling should all be noted in an on-site, written logbook.

To reduce the danger to the farm's biosecurity, significant maintenance and mechanical repairs should be made between flocks and in combination with cleaning. Pre-placement inspections are crucial because they may assist make sure the coop is prepared to securely and pleasantly house new birds. Before housing a new flock, create a documented plan and checklist of the spaces and objects that must be checked for upkeep. Examples of things to mention are, to avoid over- or underfeeding, inspect feed scales and calibrate weighing devices. It's a good idea to calibrate feed scales once a month. Check the feed bin cleaning procedure to verify that the machinery is dry and clean before accepting fresh feed[5], [6].

Feed delivery systems:

Verify feeder setup, chains, and augers to make sure the system will operate to feed the birds and is safe and won't cause harm to the birds.

Water

Inspect drinker nipples and water lines for water. To guarantee that all cleaning and disinfection agents have been removed from the lines, flush the water system.Check fan belts, fan motors, louvers, gas lines for heaters, and other ventilation components to make sure they will operate properly to maintain the right temperature for the comfort of the birds. Before bringing in birds, ventilate the home to get rid of chemical smells left over after cleaning and disinfecting. To guarantee that the controller settings are precise, calibrate the sensors and thermometers.Cycle all drapes and vent doors around the house to check for damaged or twisted cords that can affect the efficiency of the ventilation system.

Replace any flickering or damaged light bulbs in the home, and check the security and safety of any dividers or other bird equipment so that any necessary repairs may be performed before the flock arrives.During an emergency, examine the generator to make sure it is operating properly and can immediately provide backup power to the farm. Once a month, generators should run under load to make sure they are functional. Have the generator inspected every year by an electrician or generator expert. To ensure that audible alarms are operational and radio/automated alarms reach the appropriate person in the event of an emergency, test the alarms, alarm system, etc.Visually inspect the outside of the building to confirm that the biosecurity and premise security are operational.

Plans for emergencies and alarms

There might be problems that need urgent solutions. Both minor and big occurrences have the potential to harm housing and restrict or deny access to feed and water, among other necessities. Breeder operations must, at the very least, have a written plan for emergency responses that details standard operating procedures for dealing with structural damage, power outages, water shortages, the presence of notifiable diseases, catastrophic problems that make it impossible to deliver feed, and emergency depopulation.

Alarm systems should be utilized to continuously monitor the environment and housing systems in the coop, which are essential for supplying the flock's daily demands. Ideally, on-site backup systems like electrical generators and a supplementary water supply should be available and frequently checked. A prominent location should be designated for posting the contact details of the emergency response services and the personnel in charge of handling crises.

DISCUSSION

Increasing the size of the brooding space as rapidly as possible while keeping the proper home temperature is the aim of the brooding chamber design and administration. Prior to enlarging the brooding area, heat and ventilate the unoccupied space to the appropriate temperature for at least 24 hours. Generally, depending on the ultimate density capacity and the state of the house building, the rearing house walls should be totally open after 14 to 16 days.The size of the brooding space and the equipment will determine the placement density in the brooding chamber. Initially, there shouldn't be more than 55 to 60 birds per square meter. Make sure there is enough room for drinking, particularly during summer settings. If nipples are readily stimulated[7], [8].

Stocking level

Upon arriving at the farm, chicks from donor sources that are the same age should be put in the same enclosure. These groups will be raised together, which will increase flock homogeneity later. Excellent performance during raising depends on proper stocking density. Correct stocking density has significant welfare consequences in addition to performance and uniformity. Climate, housing kinds, ventilation systems, processing, and welfare laws must all be taken into account when determining stocking density.

It is crucial to keep in mind that the needs for feeder and drinker space dictate stocking density during rearing and production. Regardless of age, feeder space is the most crucial need. Flock homogeneity will suffer if the criteria for feeder space are not reached because birds will fight for the available food. Birds need water to digest their food, thus drinker space is crucial. There may be considerable rivalry for water access when the feed is finished.Cobb advises that males and girls be raised in separate environments from placement until transfer or mixing. Farmers will be able to achieve their ideal bodyweight, uniformity, and frame goals for both males and females via this method. During raising, males should be provided more floor area to ensure they reach their desired bodyweights. At the same age, men will weigh substantially more than girls. Therefore, maintaining a healthy weight is crucial for the development of a consistent frame size and sexual synchronization with females.

Additional drinkers

Chicks may utilize drinker systems that are well-equipped in many contemporary chicken homes when they are placed. Use just the principal drinker systems wherever feasible to help chicks pick up on the system as early as possible. Open trays are not advised if more drinkers are required since chicks might submerge themselves in them and/or pollute the water with litter and feed, resulting in poor water quality. It is never a good idea to position supplemental drinkers immediately below the brooders since this will heat the water, making it too warm to drink and increasing water evaporation[9], [10].

Additional feeds

Feed should be provided immediately before the chicks arrive, and extra feeding equipment shouldn't be put below or too near to the brooders. One feeder tray should be available for every 75-day-old chick, and extra food should always be kept fresh. After day 7, remove extra feeder trays.Another option is to spread 30 g of feed each bird onto a sheet of paper that covers 50% of the placement area. Within the first three days, you should finish up this feed allotment. The chosen paper has to be robust and impermeable. Due of the hazards associated with biosecurity and the poor material quality, we do not advise using old newspaper or other types of recycled paper. After the meal has been devoured, throw away any leftover paper.Add new, fresh litter all over the floor. The litter material must have a dry, supple surface that transfers radiant heat. Firmly compressing and scraping the bedding will level it. Because of the uneven warmth of the floor caused by uneven litter, flocks of chicks congregate in pockets or beneath machinery. Uneven litter might also unintentionally hinder access to food and water during this crucial developmental stage. The insulation of the floor, the use of plastic under the concrete floor to avoid capillary action of water, summer and winter weather conditions, ventilation, and bird densities all affect the height of the litter. Utilize as little litter as you can to make working in it simpler and to keep the height level consistent. Bird waste will build up in the litter from raising to harvest. Use 3 to 5 cm in summer and 5 to 7 cm in winter as a decent guideline.

Enrichments

As they may decrease "negative behaviors" and boost "positive behaviors," enrichments are thought to be advantageous for chickens. Typically, enrichments include sensory inputs that provide an animal option within its surroundings. A change in behavior or activity connected to social contact, occupational outcome, physical outcome, sensory stimulation, or nutritional stimulation may be brought on by the item or technology. The welfare-related objectives for integrating enrichments into the rearing and laying environment for poultry include: increasing behavioral diversity; decreasing the frequencies of abnormal/negative behavior; expanding the range of normal behavior; increasing positive environment use; and increasing the animal's capacity to deal with difficulties or changes. Incorporating enrichments may also help achieve the following flock performance-related objectives for poultry: increased flock mixing in scratch areas; decreased floor eggs; enhanced foot and leg health; decreased breeding flock mortality; and increased overall egg production for the breeder flock. Enrichments shouldn't pose a threat to the flock's health and welfare, shouldn't raise biosecurity concerns, and shouldn't have a negative impact on the economy.

Physical, nutritional, and social stimulation to boost foraging or dust-bathing activities, as well as sensory stimuli, are examples of common enrichments that may be employed in broiler breeder farms. Not all enrichments can be utilized in both production and raising; as a result, they should be carefully chosen and applied for the age and kind of chicken. Other enrichments, such as slats and perches, may be utilized in both rearing and laying farms to encourage birds to experience elevated equipment and various flooring types in order to help them adapt more quickly to production house configurations where slatted floors and elevated perches are frequently used. The height of chain feeders in raising should be controlled such that all birds have easy access to food while also requiring the birds to simply hop on and off the tracks to increase exercise and mobility. If the feeder track has legs, the birds may be able to sit on it.

Lighting

Bird activity is affected by light distribution and intensity. For appropriate feed intake, the development of the digestive and immunological systems, and excellent wellbeing, proper activity stimulation with illumination during the first 5 to 7 days of life is required. To increase chick movement and promote healthy early feed and water intake, light intensity should range from 60 to 100 lux assessed at chick height. The chicks will be drawn to concentrated light along their nipple lines, and as they socialize with one another, their early water and meal intake will increase.

When chicks are placed, they should have 23 hours of light. Start limiting the light time when the baby is 4 days old. The lights should always be turned on at the same time each day. Always modify the lights-out time when changing the lighting period. By 14 days of age, the necessary 8-hour day length will be attained by lowering light intensity by one or two hours each day. Depending on the light source, we advise extending the 8 hours of light exposure with a light intensity of 2 to 4 lux till photo stimulation.

From the brightest to the darkest area at floor level, the light intensity shouldn't change by more than 20%. At avian level, the light intensity from various light sources might vary greatly. It will be easier to maintain equal litter levels throughout the home and a constant height from the litter to the chain or pan feeders if lighting is distributed uniformly throughout raising. For all females to have easy access to food at the same time, this is crucial. unequal heights along the feeder track are caused by the birds' propensity to scrape

trash in the brighter regions of the home due to the unequal distribution of light intensity at bird level. Therefore, uneven access to feeders will result in poor flock homogeneity.

During immunization, bird grading, and bird weighing, do not increase light intensity. The eight hours when the lights are on should be used for any home upkeep. After 21 weeks of age, birds become less responsive to photo stimulation, regardless of light intensity changes. The duration of the day during raising will hinder the sexual development of both males and females, thus this should be avoided. The floor and surrounding temperature should be checked prior to dumping chicks at the farm. To avoid heat stress, chicks should stay inside the climate-controlled chick van if the home is too chilly. Verify the box identification throughout the receiving process to make sure that the male and female chicks are put in the appropriate pen or home. For the wellbeing of the animals, chicks must be placed in the brood area carefully and deliberately.To maximize the comfort, security, and quality of the chicks, take into consideration the following while putting them.

All employees must use caution while handling chick boxes when they are being unloaded from the truck, moved about the home, and placed. As harsh movement has the potential to harm chicks, it should be avoided. Until each individual box is tilted for chick insertion, boxes should ideally always stay level.The chicks must be carefully placed by farm employees in compliance with business drop height restrictions. For chicks, the drop height shouldn't be more than twice the bird's height. This requires that the box be held firmly in place with both hands and that the tipping motion reduce the distance from the box's bottom to the waste.It's very vital where the chicks are put. Chicks should be carefully set down on starting feed lids, starter feed paper, or litter. Chicks shouldn't be placed on top of heavy objects or over other chicks. When chicks are placed on the litter, they should be close to a brooder but not immediately below it and should have easy access to food and water.

Chick unloading should ideally be swift and effective to reduce exposure to outside environments that might cause heat stress in the chicks. To ensure that chicks are dispersed fairly from the start, all boxes should ideally be put in the house or brood area. After the boxes have been dispersed, start placing the chicks at the rear of the house or in the brood area and work your way forward slowly and carefully. This will lessen the chance of chicks being hurt or becoming tangled up in the staff members' feet during the receiving procedure. Limit your speaking as much as you can. Chicks should not mistakenly identify sounds as the mother hen while they are searching for her. To avoid any possible entrapment situations for the chicks, remove any paper liners, chick boxes, lids, etc., and dispose of them bio-securely. After placement, all employees should leave the building for two hours so the chicks can become used to the lobby. It is impossible to overstate the value of the brooding phase. A chick's first 14 days of existence establish the standard for success. Extra work put in during the brooding stage will pay off in the flock's ultimate performance.

Chick Coziness

After being placed, check the chicks two hours later to allow them time to settle in and learn the location of the reception area. Make sure they feel at ease. Following placement and for the first 24 to 48 hours of brooding, it is important to carefully watch the distribution and behavior of the chicks. It is typical to witness some chicks resting, some consuming food or liquids, and yet others exploring their new surroundings. Investigate the issue right away if you see chicks panting, huddling, chirping loudly, or dispersed unevenly throughout the brood space. They may have a detrimental effect on flock welfare and performance results if they are not fixed.

Staff members should speak quietly and walk gently about the home when depositing chicks and inspecting throughout the brooding period to reduce stress. Staff should leave chicks alone for at least two hours to give them time to settle in and relax after making sure they are all properly situated and comfortable.Chicks will huddle in the cold with less movement, which will lead to less feed and water intake and, ultimately, less development. The chicks should be hopping about the brooding space equally if they are warm enough. The chick's feet are a great way to gauge the temperature of the floor. You may gauge the chick's temperature by pressing its feet on your neck or cheek. The internal body temperature of the chick decreases if its feet are chilly. Reevaluate the preheating temperature as well as the present ambient and floor temperatures in the brooding area if the feet are chilly. A little rectal probe thermometer with a soft tip may be used to test the internal temperature of a chick. For these chick checks, digital thermometers with quick reading are advised.

The ideal internal temperature for newly hatched chicks is 40 to 40.6 °C. In the first four days, a chick's internal temperature above 41° C might cause panting. A chick is too chilly if its internal temperature is lower than 40 °C. At hatching, the chick is unable to regulate its body temperature properly and must rely on the surroundings for heat. The chick must adapt to extreme temperature changes by panting or burning energy to create heat. Both scenarios have a detrimental effect on outcomes related to weight gain, growth, and wellbeing. The provision of the proper temperature during brooding may eventually have an influence on production performance since freezing or overheating during this period can lead to poor growth, poor feed conversion, and increased susceptibility to illness. The chick will be fully capable of controlling its own body temperature around 12 to 14 days of age. The brooding temperature must be changed every few days to account for variations in the internal body temperatures of the chicks, changes in the size and heat output of the birds, and the maturation of thermoregulatory skills. The brooding area's temperature has to be comfortable enough for the chicks.

The birds may be spread evenly around the brooding space with appropriate access to food and water at the ideal temperature. Keep a close eye on bird behavior since it is a reliable sign of a chick's comfort.

CONCLUSION

In conclusion, establishing a solid base for chicken production requires careful planning and control of the brooding process. Producers may enhance the development potential of their flocks and encourage sustainable and lucrative poultry enterprises by focusing the health and well-being of young chicks via the use of appropriate brooding techniques. Designing and managing brooding effectively is essential for the success of chicken production since it directly affects the development and health of young chicks. The crucial significance of well-designed brooding methods and their consequences for the welfare and production of chicken flocks are reiterated in this conclusion. A thoughtful brooding design takes into account a number of elements, including as biosecurity protection, lighting, ventilation, and temperature management. In the crucial first few weeks of a chick's existence, these factors are crucial for maintaining a pleasant and disease-free environment. Additional factors that affect the welfare and development of chicks include adequate bedding, nutrition, and water sources. Effective brooding management requires constant observation and adjusting of the brooding circumstances as well as proactive illness control strategies. Additionally, education and training are essential for ensuring that poultry farmers and employees have the knowledge and abilities to continuously use best practices.

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CHAPTER 6

FLUSHING WATER SYSTEMS FOR POULTRY FARM

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ABSTRACT:

The flushing of water systems in poultry farms is a critical practice that ensures the delivery of clean and uncontaminated water to birds. This abstract provides an overview of the importance of flushing water systems in poultry farms, highlighting its role in maintaining bird health, improving production efficiency, and mitigating the risk of waterborne diseases.Flushing water systems involve the periodic removal of sediments, biofilms, and microbial contaminants from water lines and storage tanks. It is essential for preventing the buildup of pathogens and contaminants that can compromise poultry health and performance. Proper flushing protocols encompass considerations such as water quality testing, equipment maintenance, and the use of sanitizers to optimize system hygiene.The benefits of effective water system flushing extend beyond immediate health improvements, contributing to enhanced feed conversion, reduced mortality rates, and increased overall farm profitability. This abstract underscore the importance of regular monitoring and maintenance of water systems and encourages the adoption of best practices in poultry farm water management.

KEYWORDS:

Avian, Broilers, Chickens, Eggs, Farming, Flock, Hatchery.

INTRODUCTION

The 1–2 g of fluid in the yolk ensures that the chicken loses weight but does not get dehydrated. In the first 24 hours after beginning to pant, chicks may lose 5 to 10 g of moisture, which will result in dehydration. Correct brood temperature is crucial since higher relative humidity will prevent moisture loss but also hinder heat loss. Because they generate less heat, chicks from smaller eggs demand higher brooding temperatures.The yolk is made up mostly of fat, with just a little amount of protein, which is used for growth. If the chick doesn't start eating early, it will utilize the yolk's protein and fat for energy, leaving it with insufficient quantities of protein for development. For chicks to maintain metabolic functions, such as internal body temperature, early meal intake is essential[1], [2].

Crop Fill Assessment

Getting as many chicks to drink and eat as possible within the first few hours after they are placed on the farm is the primary goal of management. Failure to meet this goal will result in flock performance issues that cannot be fixed, such as low growth, poor feed conversion, and poor flock uniformity. Per brooding area, sample 100 chicks. A minimum of 85% of the chicks should have both feed and water when their crops are checked eight hours after being placed. The morning following installation, the bird should have at least 95% of its crops full. Evaluate water availability, water temperature, flow rate, and other factors right away if too many crops are hard to figure out why chicks may not be able to obtain water in the brood area. Assess the availability, placement, and presentation of the feed as soon as too many crops are soft, and make sure the right feed was given to the farm. To find out why chicks may not be able to reach feed in the brood area, check the temperature of the surrounding air and the ground[3], [4].

Conditioning the beak

Beak conditioning may be carried out at day old at the hatchery or at 4 to 5 days old on the farm. This process is carried out in the hatchery by skilled workers, and it often entails the use of automated equipment that treats the beak tip with infrared radiation. In order to reduce bird stress, conditioning the beak at 4 to 5 days on the farm takes extra work and specific consideration.Beak training may result in an ideal beak shape for breeders to feed and drink from, as well as the prevention of aggressive pecking, which can cause harm to birds, damage to their skin, and even death.

Moreover, the bird's capacity for eating and drinking may be hampered if the upper beak is noticeably longer than the lower beak. A rooster's ability to successfully mate may be hampered by a longer top beak because it may be harder for him to grasp the hen's neck feathers. The beak has to be maintained in excellent shape for feeding and drinking since it continues to develop as the bird matures. Technical management should assess the beak's form throughout the life of the bird.For birds reared in open-sided housing or without regulated light intensity, beak conditioning is particularly advantageous. When compared to birds grown for 20 weeks in light-controlled housing, chicks raised in uncontrolled illumination often develop their beaks more quickly and reach maturity sooner. Pecking gently at feathers and other nearby items is seen as natural behavior[5], [6].

Management of Water

The design of each bird's beak should be carefully examined before immunization. In order to eat and drink, the beak must have the proper shape. This will increase flock homogeneity and fertility. To ensure the bird has the least amount of stress possible, the beak conditioning apparatus should only be used by qualified individuals. When reconditioning the beak tip, just the keratinized portion of the tip should be removed. The bird should be taken from the flock and humanely put to death if the beak abnormality is severe or if reconditioning the beak is not an option. Make sure there are enough feeders and drinkers, in proportion to the stocking density, and that they are close to one another. In order to maintain the chicks' thermal comfort zone, it is critical that these spaces have the proper ambient, floor, and litter temperatures[7], [8].

Additional Drinker Screening

There should never be an empty cup in the supplementary drinkers. Drinking vessels need to be cleaned and replenished as required. Keep the additional drinkers' water levels at their maximum until the chicks are big enough to cause spills. About 48 hours after installation, extra drinkers should be taken out. Water waste and spills should be maintained to a minimum, particularly during the colder months when there is less air exchange to remove moisture.

Check the nipple drinker

For the first two days, the nip drinker height should be at the level of the chick, and after that, it should be kept at a height that requires some modest stretching on the part of the birds to reach. On the litter, the birds' feet should always be flat. Never should a bird have to balance on its toes in order to drink. A drop of water should be hung from the nipple due to the pressure. Nipple flow rates of 25 to 30 ml per minute are often advised during the first week. However, follow the manufacturer's directions at all times. Although birds can handle a broad variety of water temperatures, the ideal range is between 10 and 14 °C; nevertheless, water

temperatures should never exceed 25 °C. The drinking system has to be cleansed at least three times daily if this happens.

Test for bell-drinkers

It is crucial to regularly review and make adjustments. At one day old, the water level in the bell drinker should be 0.5 cm from the drinker's lip, and after seven days, it should be progressively lowered to 1.25 cm, or thumbnail depth. Bell drinkers need to be cleaned every day to avoid pollutant development. To maintain the proper water temperature in hot areas, cleanse the water system at least twice or three times per day. To prevent spills, all bell drinkers should be ballasted.

DISCUSSION

To eliminate biofilm and regulate water temperature, all poultry watering systems should be cleansed at least three times each week, but ideally every day. Infrequent flushing of water systems may cause biofilms to build up within the pipes, reducing water flow and quality. For high pressure flushing, the volume and pressure must be sufficient. The velocity and turbulence needed to eliminate biofilm from the pipe work will be produced by one to two bars of water pressure. It may be essential to flush more than once a day in warm or hot locations to lower the water temperature. There are devices that automatically flush the toilets, saving the producer time and guaranteeing that the water is flushed. Set the flush time for systems with flush modes to 2 seconds per meter of the drinking line.Any broiler breeder operation's principal goal is to produce viable, settable eggs that, when hatched, will provide the required number of high-quality chicks to fulfill the demand for broiler production. Any effective breeder management scheme heavily relies on management during the first week after hatch. The average bodyweight, flock homogeneity, mortality at day 7, and average bodyweight are important measures of flock performance. The technical effort done during the raising phase may be credited with helping to achieve superior flock homogeneity throughout the producing period. However, relying just on technical expertise and knowledge is insufficient. Plan, coordinate, carry out, and keep track of important performance metrics, such as feed consumption and bodyweight curves for production and rearing. It is crucial to keep an eye on these crucial markers and act quickly when problems arise. One of these markers, the conventional bodyweight curve during rearing, is a good illustration. The production of a flock might suffer significantly if a raising flock is not kept on the typical bodyweight curve. To guarantee predictability with respect to intake and bodyweight response relative to the standard grams/bird/week, feed formulation, component choice, and feed form must be taken into consideration while managing and monitoring feed consumption. The quality of weighing and feeding equipment is also essential for managing breeder weights.For optimal outcomes, males should be reared apart from females until they are 20 to 21 weeks old. Rearing may be divided into five time periods, each lasting four weeks, and each with significant elements affecting the bodyweight curve[9], [10].

Consuming Food

In both the raising and producing phases, feed cleaning time, also known as feed intake time, is a crucial factor. Over the course of the raising period, cleanup times will vary and will be influenced by a number of critical elements, including feed volumes, genetic line, feeding program type, feed shape, and light intensity in the home.During the restricted development phase of the raising period, pullets will start quickly cleaning up the feed. From 10 weeks of age until photo stimulation, allow a feed cleaning period of around 40 to 60 minutes. This gives everyone an adequate amount of time to eat. If cleaning takes less than 30 minutes, use a different feeding plan like 5/2 or 4/3 to increase feed volume and extend cleanup time. Hen

cleaning time is one of the production-period metrics used to pinpoint the first feed reduction following peak output. Feed size and texture are important determinants of cleaning time. We advise crumbling feed in raising and producing to extend feed consumption time. Some farmers could utilize mash coarse feed, which requires more time to consume than crumble. Because pelleted feed may be rapidly eaten and may not have enough volume to ensure uniform distribution, we oppose using it in raising or production. For the wellbeing of the flock, consistent feed distribution is just as crucial as knowing when and how often the birds eat. Birds will learn to anticipate food and make the necessary adjustments. For the flock, irregular feeding schedules or interruptions to the typical feed regimen may be quite distressing. For the welfare of the birds and their health, consistent feeding schedules are essential. Keep the feeding time the same while switching from one feeding program to another by paying attention to flock behavior, cleaning time, and activity level.Breeders must have the proper feed composition and nutritional content in order to express their genetic potential and lay viable hatching eggs. To guarantee that the hatching eggs are free of contaminants and contain all the nutrients required for the hatching of healthy broiler chicks, high quality ingredients must also be employed.

For high performing flocks, the right feed parameters are a critical component of raising and productivity. Pullets must be properly fed in order to be prepared for production. If the pullets are not well condition because to subpar feed standards, effective rearing management with high uniformity and bodyweights on standard will not ensure good output. If the feed is not up to requirements, getting consistent outcomes will always be difficult. To comprehend why and how the pullets grow, mature, feather, and prepare for photo stimulation, the feed requirements must be incorporated into the management techniques. Always use high-quality feed components, and make meals according to the Cobb guidelines we provide in our supplements.To maintain bodyweights on the standard curve during rearing, a standard feeding profile should be followed. Any little variations in bodyweight from the norm may be corrected with tiny 1–2 g feed increases. Use the feeding regimen as a general guidance throughout raising after it has been set. Body weight might vary by up to 2% from the average. Preventing feed composition changes and closely monitoring each feed delivery will ensure constant performance. Report any issues right away. Samples of the feed should be kept on the farm for possible testing.

Phase 1: Management of the early feed

The brooding stage is used to train the chicks to control their development. The parent stock broiler breeder comes from populations that have been bred for attributes that make for attractive broilers, such as average daily gain and feed conversion, both of which have a negative impact on reproductive efficiency. Birds must be controlled following a certain growth curve proposed by Cobb in order to combat this tendency to increase. Based on breed and sex, this development curve differs.Low water and/or feed intake might lead to a divergence from the norm in the critical indicator of average bodyweight. Another crucial parameter for creating a flock that will react predictably to feed adjustments as they mature is flock homogeneity.

Regulated Feeding

Controlled feeding is required to keep birds from gaining more weight than is healthy. Females from 4 weeks of age till the conclusion of the raising period should pay particular attention to this. For the first four weeks, maintaining the required bodyweight requirements is crucial for the development of consistent frame size in both males and females. The organs that promote the proper maturation of the breeder hen develop quickly throughout the first

month of the chick's growth. The immunological, digestive, circulatory, pulmonary, neurological, and skeletal systems are among the organs. Prevent spending lengthy periods of time below the recommended bodyweight since this can impede the organs' regular growth and cause problems later in the flock's lifespan. Performance of adult breeders suffers from exceeding or falling below recommended bodyweights. Therefore, it is advised to start controlled feeding right once after implantation. Ad libitum feeding is not advised during the first week since it might be difficult to assess how much feed the flock really ingested. It's crucial to avoid feed waste in the litter so that birds don't consume it later in life and gain weight unexpectedly. Instead, follow the instructions in the table to utilize precise quantities of feed with daily modest incremental increases. By four weeks of age, the weights of the males and females should be on target if a certain quantity of feed is fed each day.

Recommendations for feeder space

A progressive feed space plan may be used to set the system up for the right number of birds per pan or chain length at various ages, as well as to have excellent feed and bird distribution, starting with installation. Increases in feeder area should be gradual and depending on the age of the birds and the quantity of feed required to fill the whole feed track. For feed area needs dependent on flock age and sex, see the tables on the next page.Although homes often have up to four chain feeder loops, apply the following advice according to the amount of feed being given relative to the age of the birds. Divide the daily feed allowance across two loops for infants ranging in age from 0 to 5 weeks. From 5 to 11 weeks, the feeding track should be extended to 3 loops, then from 12 to 20 weeks, to all 4 loops.

The typical female's length and breadth, 30 and 15 cm, are used in the computation of feeder space. Using a chain feeder as an example, 10 birds may fit on one side of the feeder with a length of 1.5 meters. The distance between the broadest section of the bird and a pan or oval feeder is really 10 cm, or 50 cm. Therefore, use the formula $2r = 157$ cm to get the real feeding circle's circumference in order to compute the feeding space.The minimal distance between feeder lines is 60 cm, or the length of two birds from tail to tail. But there isn't enough space for birds to fly between the feeders. As a result, one bird may cross between feeders that are 75 cm apart, and two birds flying in different directions can pass between feeders that are 90 cm apart. The broadest section of a fully developed hen is used to determine how much chain feeder space is needed. Calculate how many birds each side of the chain feeder can hold by multiplying the linear length in cm of the chain feeder by 15. The width of a fully developed hen is used to determine the amount of space needed for oval and pan feeders. Calculate the amount of linear space available for the birds using the actual feeding circle.

Cheap ways to enhance feed distribution Additional hoppers may be added to the system to increase feed distribution points. It is possible to add more chain system loops or feeder lines. Train the birds to connect a particular signal, such as the sound of the feeder or signal lights, with food. With sufficient access to the feeder, this procedure will enable birds to spread out. For instance, training the birds to anticipate eating after this signal may be accomplished by turning off the lights before and during meal delivery. The birds won't move very much when you enter the home in the dark after distribution, which will lower their tension.To establish flock homogeneity, precise weight data must be gathered using reliable sampling techniques. The objective is to weigh enough birds to correctly reflect the flock's average bodyweight. Each bird should be weighed separately at placement, seven and fourteen days later. Bulk weighing of the chicks helps speed up placing. Use an electronic platform scale with adequate surface area to weigh a group of 5 to 10 chicks if you're bulk weighing. Maintain a constant group size to avoid counting the chicks incorrectly. To accurately estimate average

bodyweight and determine flock homogeneity, at least 2% of the flock must be weighed.It is advised to increase the sample size to 3 to 5% of the population after the flock is 3 weeks old. To make the sample more typical of the flock, weigh birds three times from each dwelling.

Use a capturing pen, do not pick up and weigh birds at random, and do not force birds into the pen in order to maximize the sampling's accuracy. A non-representative flock sample may be obtained when birds are forced into the pen or when birds are caught and put in pens just part of the time. The catch frame should be positioned such that the birds may easily enter the pen in order to get a more accurate representation of the flock. Weigh each bird within the capture pen separately, including the smaller ones, and accept all weights barring sexing mistakes. Release the bird inside the home once each bird has been weighed. Once the pen is empty, keep weighing. Calculate the average weight and the distribution of the flock's weights after recording each weight.

The goal of the brooding period is to get the chicks moving and prepare them for restricted feeding. The major goals of the maintenance phase are to regulate weight and fleshing. During this stage, it's crucial to handle the birds often to gauge how well they've been fleshed out. It will be easier to comprehend the birds' growth and physical condition by touching them often and at various ages. Prior to photo stimulation, bird condition is crucial. Correct weight management and routine assessment of body condition or fleshing are the only ways to obtain the appropriate bird condition. It's crucial to avoid falling below the bodyweight limit for protracted periods of time since the support systems are still being developed. A modest increase in feed quantity is advised if the males do not reach their goal bodyweight during the first four weeks. Alternately, the length of the day may be extended so that the males can eat any food that is still in the feeding system.

Feeding strategies for the best raising practices

The development, weight gain, and maturity of breeding flocks are managed via the use of feed allocation plans throughout the raising period. When creating and executing a feeding regimen during the raising phase, be mindful of any applicable national laws. Feeding might take the form of daily or alternate-day feeding.

Tips for Animal Welfare

Feed allocation techniques are often utilized in breeding operations all over the globe for a good net welfare gain. Innovative study has lately shown that feeding raising flocks a scratch diet or "filler diet" on the customary off-fed days may be beneficial. Since there is no prolonged gap in feeding, this filler diet has the advantages of making birds calmer, more consistent, and with greater gastrointestinal integrity.

Daily Feeding

The birds must be fed every day depending on the local welfare regulations in different nations. With this feeding strategy, a daily allotment is provided that is intended to control development, sexual maturity, and productivity.

Program 6/1

This eating regimen is often utilized as a transitional phase or bridge before moving on to a 5/2 or skip-a-day regimen. At the conclusion of the raising phase, it may be utilized to resume regular feeding. The 5/2 or skip-a-day program is often started 1 week before this program in the third week. The 6/1 program is also employed towards the conclusion of raising for a

period of 1 to 2 weeks, depending on how quickly the birds take the feed and if there are problems with feed distribution.

Program 5/2

This method of child raising is the most often employed across the globe and acts as a middle ground between daily feeding and skip-a-day feeding. Its major purpose is to preserve or improve regularity and excellent feed distribution. The 4/3 or skip-a-day feeding programs are often utilized in the latter stages of the growth season, especially if "feed impaction" is a problem on feed days.

Program 4/3 and Skip a Day

When feeding modest amounts of a high-density meal or when feeding space is limited, these regimens are favored. It guarantees a longer feeding time and enables cautious birds to eat adequately. The equivalent of two days' worth of food is fed every day from 21 or 28 days to 140 days, with the next day's meal consisting only of scratch. It is essentially an on-and-off day feeding if little feed quantities can be administered. As a result, the quantity of feed on feeding day will double if you miss a day. On a feeding day, the feed volume is raised by 75% under the 4/3 scheme. When the meal is presented as a pellet or crumble, this program is employed.

On days when there is no food, flocks exhibit increased stress-related behaviors. cannot feed more than what is being fed at peak productivity on a given day. At roughly 19 to 20 weeks of age, that quantity is fed. At that point, it is necessary to switch to a 4/3 or 5/2 schedule for a few weeks before switching to daily feeding. If the feed volume on a feeding day is too high, the flock runs the danger of overconsumption, which may result in overeating, pendulous crops, and even mortality. Change the feeding regimen to the 5/2 program if feed shock develops.

CONCLUSION

In poultry farms, flushing water systems is a crucial part of overall farm management, having significant effects on the health, production, and long-term viability of the business. The importance of flushing as a preventative step to preserve clean and pathogen-free water is highlighted in this conclusion, which also highlights the vital role that water quality plays in the production of poultry. Poultry producers may protect water quality by employing routine flushing techniques that stop the buildup of sediments, biofilms, and pollutants. As a result, the danger of waterborne illnesses is reduced, and the flock's general health and wellbeing are enhanced.

Additionally, flushing results in greater water quality, which helps with feed conversion, mortality rates, and production efficiency. Finally, it should be noted that cleansing water systems in chicken farms is a crucial procedure. It is a crucial component of poultry management that promotes the wellbeing of the birds as well as farm profitability. Poultry farmers may improve their operations and guarantee the long-term viability and sustainability of their farms by following best practices for water system cleansing and placing a priority on water quality.

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CHAPTER 7

HOUSE PREPARATION FOR TRANSFER AND PRODUCTION

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ABSTRACT:

House preparation for the transfer and production phase in poultry farming is a critical aspect of ensuring the well-being and performance of the flock. This abstract provides an overview of the importance of thorough house preparation, outlining key considerations and practices that contribute to a successful transition from one flock to the next.Effective house preparation involves a series of steps, including cleaning and disinfection, maintenance and repair, and environmental adjustments to create an optimal living condition for the incoming flock. Proper cleaning and disinfection are crucial for preventing disease transmission and minimizing the risk of pathogen carryover from previous flocks. Maintenance and repair work ensure that the house infrastructure, including ventilation, heating, and lighting systems, is in good working order.Furthermore, environmental adjustments such as litter management, temperature control, and biosecurity measures are essential components of house preparation. These measures collectively contribute to creating a comfortable and disease-free environment for the new flock, promoting their health and productivity.

KEYWORDS:

Poultry, Production, Raising, Rural, Sustainability, Welfare.

INTRODUCTION

The amount of time needed for feed cleaning significantly decreases when utilizing a regular feeding schedule. The more fearful birds may not be able to eat or may not have much to eat, which will affect uniformity and make the birds more tense. If there is a problem with feed intake uniformity, a crop inspection performed soon after feed cleaning will reveal it. A modest quantity of feed from the crop should be consumed by no more than 2% of the birds. Introduce a 6/1 regimen for one week, followed by a 5/2 program at four weeks that lasts until 18 to 19 weeks. Return to daily feeding at 19 weeks. When feed volumes are extremely low or the birds are given pelleted diets with feed cleaning periods of less than 30 minutes, a 5/2 or 6/1 feeding schedule may be continued until the week of photo stimulation. When the meal cleaning time is less than four hours, which occurs frequently between 14 and 18 days of age or into the third week, the transition from a daily feeding schedule to an alternate feeding regimen often begins. It's crucial to keep an eye on the behavior and health of the birds while switching between alternate feeding schedules, such going from 4/3 to 5/2.

Impaction might result from switching from a lower feed quantity to a larger feed amount on feed day. Giving the flock a chance to drink 30 to 40 minutes before to feeding may help the feed the flock consumes stay wet. Crop inspections after feeding might assist the farm team members comprehend the bird's condition after eating if harmed crops are seen. During the raising period, management concentrated on meeting the Cobb-recommended uniformity and bodyweight criteria. From 8 to 12 weeks, management continues to prioritize bodyweight and uniformity requirements while also preserving frame size. The weekly feed increases at this time are the smallest of the whole raising period, with females ranging from 1 to 3 g. If flock is over or below curve, please refer to 8 to control bodyweight back to standard[1], [2].

Managed Growth

During this stage, the emphasis switches from bodyweight to fleshing scores. By 12 weeks, the skeletal structure is nearly 90% finished, thus feeding resources will be directed toward fleshing. The flock's fleshing scores should rise from 2 to 3 at this stage. Additionally, as the birds continue to develop, strain on the infrastructure for delivering feed and water will rise. At every stage of growth, the proper amount of feed and drinker space must be given. The chart lists the fleshing goals for females between the ages of 12 and 22 weeks. Puberty begins at 12 weeks of age, and females must be on a fleshing target to meet the fleshing goals at later ages. The chart is simply intended as a reference, but it emphasizes the value of routine fleshing and the need of starting the fleshing assessment at 12 weeks of age in order to guarantee growth and optimal symmetry of the breast muscle[3], [4].

At these particular ages, the pullet weights and the fleshing assessments may be coupled. As seen in the table, the majority of females have a fleshing score of 2 at 12 weeks of age. Over the course of the flock's life, the proportion of pullets with a score of 2 decreases steadily and, ideally, should be zero at photo stimulation.Achieving the early fleshing goals between 12 and 16 weeks will encourage the abdominal or pelvic fat deposition needed for photo stimulating females. If these goals are not met, it will be exceedingly challenging to improve the flock uniformity, female body composition, or fleshing condition in the future.At 12 weeks of age, the interpretation of flock fleshing scores should take precedence over bodyweight when making feed management choices. The production team will be able to make important choices for future management, such as feeding, lighting, transfer age, etc., if all team members agree on the fleshing scores and flock development.

After 20 weeks of age, condition or uniformity cannot be altered. The pullet must have sufficient fat reserves and fleshing at this stage since the female's body composition is just as crucial to photo stimulation as the bird's weight. Birds readily swell between the ages of 16 and 20 weeks. With regard to storing fat, however, this is not the case since pullets begin storing abdominal fat at the age of 17 weeks.

Enhanced Growth

Consistent weight increases are required throughout this period. To enhance peak egg production and preserve post-peak persistency, the females will be able to achieve the required fleshing and sexual uniformity with the help of this weight increase. During this period, continuous weight increase is necessary, but pullet fleshing scores are more significant. The goal of the period of rapid development is to give the hen with sufficient fleshing and fat stores to sustain her through her peak productivity.

1. Before photo stimulation, body fat must be reached in order to:

2. The ladies' excellent sexual synchrony

3. A high rate of peak output and persistence

4. Early in the production cycle, high hatchability of eggs

5. Wholesomeness and quality of the chick

6. Low female mortality during the time before peak production

When utilizing the Cobb suggested feed requirements, a minimum increase in female bodyweight of 36% is required between 16 and 20 weeks. Under typical circumstances, the

feed must be raised by a minimum of 42% to produce this growth of 36% in bodyweight. Don't eat at this time dependent on your bodyweight. Employ a set feeding profile.

Extremes in the development of flesh and fat

At 20 weeks of age, a pullet with a fleshing score of 2 won't typically have pelvic fat or a fat vein deposition. Puberty onset has a lower priority than tissue development and maintenance. Pullets with a 20-week fleshing score of 2 will thus have delayed sexual maturation. These pullets may reach sexual maturity, although they often have production problems.

DISCUSSION

Slats with a good design are essential to avoid floor eggs. It is typical to utilize a ratio of 60% floor area to 40% slat area. Slats must reach 2 m from the front of the nest on either side of a home that is 12 m wide. Slats must reach 2.7 m from the front of the nest on each side of a home that is 14 m wide. If using plastic or hardwood slats, use a 7° slope. When building communal nests, hardwood slats are recommended because they are cleaner than plastic slats, contain fewer slat eggs, and are easier for females to reach. Additionally, the caretakers find it simpler to cross hardwood slats while inspecting the nests for mortality, cleanliness, and if the eggs are properly rolling onto the belts. Use of 1.2 m wide mini-slats with just enough room for one drinker line is prohibited. This approach may result in floor eggs and has wildly variable outcomes[5], [6].

Feeders

The female feeder lines should be on or hanging above the slats in at least one line or loop. Put one feeder line on the slats for a home that is 12 meters wide. Place two feeder lines on the slats in a home that is 14 meters wide. The first feeder should be at least 50 cm away from the slat step-up.

Drinkers

The distance between the nipple drinker line and the nest entrance must be between 60 and 70 cm. Around 60 cm should be the space between the water line and the first feeder loop. For females, avoid running water lines through the scratchy region. A bell drinker should be inserted for every 75 birds, or 8 to 10 females per nipple.

Lights

In order to prevent the slats from casting a shadow over the scratch area, lights should be positioned just outside the slat region and slightly above the beginning of the litter area. High light intensity and homogeneous lighting should be present in the scratch area. The lights should be placed such that 2 to 4 lux may reach the nest entrance's rear. No additional lighting is required within the nest or above it.

Ventilation

Regarding ventilation, it's crucial when utilizing cross-ventilation that no air pass through the nest and create drafts. A proper cooling system is necessary in tropical or hot locations to avoid extremely high temperatures in the home and consequently nesting. Females will deposit their eggs on the slats or scratch area if the nests and home are too hot. In tropical areas, always use roof insulation with a least R12 rating; in cold climates, always use R20.

Tips for Animal Welfare

Slat height is crucial for the wellbeing of the flock and for achieving the best performance results. The 45 cm slat height that is recommended. Droppings may eventually pile between the slats, therefore the 45 cm height is advised. Droppings may begin to touch the bottom of the slats or perhaps pass through them if the slats are too low. Slats, nests, hen's feet, and eggs may get filthy and infected if this occurs. Consider putting stairs, ramps, or baskets along the slat edge for slats higher than 45 cm to make it easier for birds to get to and from the scratch area. Some slat designs include two height positions: a 35-cm position used in the early stages of creation and a 45-cm position utilized after 40 weeks of age. For the Cobb women living in communal houses, this idea is advised. Conduct a thorough audit to make sure the slats are installed appropriately to maximize welfare outcomes throughout the home preparation and before the birds are brought into the house.

A helpful tool to employ throughout the transfer process to ensure that management, handling, bird care, and biosecurity procedures are followed is a process audit for welfare. Examples of things to audit include home setup and preparation, bird health and condition, handling during unloading, feeding equipment calibration, equipment maintenance, and bird behavior and distribution after transfer[7], [8].

Nesting techniques

Manual Nesting Techniques

In parts of the globe where labor is less expensive, manual nesting methods are still used. With these arrangements, 4 hens should have access to one nest. In order for the nest boxes to be the most desirable location in the home for the birds to deposit their eggs, they must have sturdy bottoms and be kept up. The nest should be comfortable for the hen, have clean, dry bedding, and be bird-friendly. To make females feel safe, the optimal nest is 25 cm long, 30 cm high, and 25 cm deep. The instep should also be at least 15 cm high. For the hen to build a concave nest, fill the nests with material that is between 1/2 and 2/3 the height of the instep. If the nests are overstuffed, the hens will toss away the pricey nesting materials, making the nests less appealing. To enter the nest, jumpers should be able to reach a maximum height of 45 cm. In order to avoid having more than three eggs in a nest, which might lead to broken eggs and pre-incubation, egg collecting should be done often.

Automatic egg collecting or mechanical nesting

There is a significant global drive to automate egg collection. Individual or collective nests may automate egg collecting within the home.

Design for Community Nests

There are typically 2 nest sizes and 4 entry holes per nest unit in communal nest systems. Use the instructions to the right or follow the manufacturer's suggestions for the number of birds per nest hole. Install a nesting mechanism that produces the fewest floor or slat eggs possible. When homes are 14 meters broad or wider, always utilize the bigger nest specifications. Most nest types available nowadays don't have more than 200 females per nest unit. When starting an operation with community nests, this cautious computation might be employed. When the procedure is successful and sufficient experience has been gained, there is always the prospect of increasing the female density[9], [10].

Female Production Density

Install 3 chain feeder loops in a 12-meter-wide building. This demonstrates that the nesting area is sufficient for 80 hens per linear meter for nest systems running from the front to the rear of the home with just a cross over at both ends and one halfway through the house. Install 4 chain feeder loops in a 14 m wide house: 2 on the slats and 2 in the trash area. This reveals: Under ideal environmental circumstances, density is restricted to 7 hens per square meter. Because the density is low when just 3 feeder loops are used, it is preferable to attach a fourth chain loop to give yourself some flexibility with feeder space. Another option is to begin with 3 loops and 5.7 hens per square meter and then increase to 7 hens per square meter. When going from 3 to 4 feeder loops, it is simpler to put an extra feeder loop in the scratch area if the first 2 feeder lines are always installed on the slats. Cost-wise, increasing hen density may be quite advantageous. This is the most economical approach to raise household income per square meter and the price of raising an egg and chick. Equipment will also need to grow when female density increases. In order to maintain the proper ambient temperatures and humidity levels for the birds' comfort and the litter or shavings' preservation, a suitable tunnel ventilation system with pad cooling is essential.

Fundamental Transfer Guidelines to Improve Breeder Performance

One of the most crucial times in the lives of our breeders is transfer. The management of the raising farm, the transfer procedure, and the producing farm's preparation all play a role in the transfer's success. The facilities provided, body weight, and the lighting scheme are the key factors that influence the age at which stock is transferred to production farms. For the birds, the move may be a very stressful moment. Carefully handle the birds and have a detailed plan for the transfer. The raising and laying managers have to get together to talk about the flock before to the move. A copy of the rearing records, which should be transferred along with the flock to the production farm, should contain information on disease challenges, medication, and vaccination programs, transfer bird numbers, bodyweights in relation to standard water consumption, fleshing and pelvic fat scoring, rearing lighting program and intensity, feed amounts, and feeding schedules, as well as any other pertinent data to help the production farm manager during the transition period.In rare circumstances, it may be essential to give the birds extra food a few days before and/or after the move. The season and the distance traveled will determine how much additional food is supplied and when. To prevent probable death, elevated stress, and unclean containers, birds shouldn't be fed on the day of transport at the raising farm.

Planning the transfer entails:

One week before to the scheduled transfer date, the laying house must be equipped with fully functional feeders, drinkers, and nest boxes so that it is ready to accept the flock. Make sure there are sufficient, spotless boxes, coops, or containers to transport the whole flock.If sexual synchronization between the sexes is to be achieved, the final male selection and transfer should take place 2 to 3 days before the transfer of the females. Any female birds that don't satisfy quality criteria should be eliminated before transfer after thorough observation of the females. Move the birds at night or in the morning, particularly in the summer when it's hot. Before removing the birds from any containers or coops with wheels that include a scratch area, make sure the way is clean. To lessen stress and keep the equipment clean, birds should move with empty crops and digestive systems.

Place the birds directly on the slats after removing them by hand from cages or boxes. Birds should be put on the litter while being transported to the laying house utilizing modules with a loader or a pullet trailer since this method uses mechanical equipment. Never put birds

directly on sturdy items to avoid injuries.After you arrive, give the tracks food. Feed will keep the birds busy, ease their anxiety, and aid in acclimating them to the new home. Feed levels may be raised by 20% for two to three days after the shift, depending on the mode of transportation and the weather. Make sure the birds have had access to food and water by keeping a careful eye on them and checking the crops. For the birds to utilize the slatted area, go through the home regularly. Use the same drinker and feeder equipment types for both production and rearing, if possible. To identify any problems, closely monitor feeding during the first three days following transfer if the equipment is different. The next day, the flock will reapply the shavings or straw across the whole scratch area.Transfer shouldn't cause birds to lose body mass, physical condition, or uniformity. When they get to the production house, they need to locate food and drink right away.

Sexual Mistakes

In the hatchery, parent stock chicks are sexed to separate the males and females. The males are often employed in the production of broilers, while the females are used as parent stock. It might be difficult to sex girls, and sometimes sex mistakes are made. However, since males will acquire a comb sooner than females, these flaws are not noticeable in the flock until 12 to 16 weeks of age. The rapid feathering parent stock, which can be identified by the color of its wing feathers, often has a sexing error rate of 0.3% to 0.5%. But the cloaca is required to sex the slow feather cross. This is more challenging and often leads to greater sexism. The genetic potential of the progeny will be compromised if sexing mistakes are allowed to remain in the flock. Additionally, it may alter the color of the feathers, reduce body weight, and negatively impact feed conversion, processing yield, and flock uniformity in broiler flocks. For these reasons, it's crucial to stop any sexing mistakes before the baby is 20 weeks old. Good dark-out rearing circumstances and low light intensity may make it difficult for producers to detect sexism. If the light intensity on the vaccination table is high enough to differentiate the sex mistakes, sexing errors may be found and corrected at 18 weeks of age during the individual immunizations. When transporting females to the production house, any sex inconsistencies that were missed during the vaccines are often readily apparent and may be corrected then. After the transfer, it's crucial that at least two persons go through the flock to check for any leftover sexing mistakes before collecting hatching eggs. Now that the fourth and fifth toes in men are treated to condition the nails, sexing mistakes may be identified by looking at them.

Getting Ready for Photo Stimulation

The percentage of pullets with a fleshing score of 3 and 4 should be 60 and 40% of the females, respectively, at the beginning of photostimulation. The first photo stimulation should occur when the baby is 147 to 154 days old at the most. Use modest feed increments of 2 to 4 g per female each week after the first photostimulation until the start of production.

Physiological Receptivity to Light Stimulation

For fast-feathered pullets, the flock is ready for photo stimulation when the dry bodyweight is between 2450 and 2600 g, and between 2500 and 2600 g for slow-feathered pullets. Additionally, 85% of the pullets contain pelvic fat, and 95% have a fleshing score of 3 or above.A pullet in good health will have a noticeable fat buildup under the wing. A sizable blood artery runs parallel to this accumulation of fat. The fat vein is a common name for this combination. It is possible to estimate subcutaneous fat accumulation using the fat vein. However, subcutaneous fat vein often develops later than the pelvic fat layer.

Around 21 weeks of age is when pullets first show signs of the fat vein. The fat vein may be evaluated at 25 weeks of age, when production has begun, and the results are the most insightful. Because of their significant enlargement to accommodate the passage of the eggs, the pelvic bones are no longer a reliable predictor of how much fat is being deposited in the abdominal cavity at this time. After photo stimulation, the pelvic gap will expand as the pelvic bones start to separate. At 21 weeks old, a pullet's breadth should increase from less than one finger to more than 2.5 to three fingers in fully grown hens. This is the main justification for why it is preferable to utilize the fat vein as a measure of fat stores after the females begin to produce. In order to increase the performance, health, and welfare of the birds during the laying period, it is always better to postpone photo stimulation if the birds are not in the proper condition.The time from light stimulation to optimum production is crucial for every breeder flock in terms of nutrition. Following light stimulation, the female will divide the available resources amongst reproductive system development, growth, and maintenance. A well-crafted management program may have an impact on the partitioning process.Feed is distributed according to bodyweight from photo stimulation until the start of production. Typically, photo-stimulated birds with the proper physical condition need feed increases of 2 to 4 g/bird/week. Consider increasing the feed quantities in two phases, such as every four days with 3 and 2 g increments, if greater feed amounts are employed, such as 4 or 5 g/week.

Feeding and the Weekly Mortality Trends It Affects

After photo stimulation, aggressive feeding regimens, like those utilized in the table to the right, result in greater weekly hen mortalities, according to analyses of weekly mortality for aggressive vs conservative feeding programs. A feeding regimen should be created to guide output through peak once the flock achieves 5% daily production. By subtracting the actual feed at 5% of output from the anticipated peak feed, this program may be created. For every 10% increase in egg output, figure out the incremental increases. Feed chickens according to body weight until productivity reaches 5%. After feeding, growth should be regulated in accordance with daily egg output. Typically, between 5% and 45% of daily output, 40% of the difference in total feed increase is allocated, and between 45% and 80% of production, 60% of the feed allocation. Peak feeds are administered between 70% and > 80% of daily output levels. It is critical that every organization assess its daily output and bodyweight gains from peak to determine if it is overfeeding. Weekly mortality associated with egg peritonitis is a blatant sign of overstimulation.

For flocks entering their peak output, make sure high-quality feed components are being utilized, especially in terms of energy and protein levels. Use the most recent Cobb feed recommendations to make sure the ladies are producing the most eggs possible. Stress is more likely to affect birds that are nearing their peak. To nurture the birds and produce high-quality chicks, high-quality ingredients are required.With 24 to 25 g of protein, 1000 to 1050 mg of digestible lysine, and 950 mg of digestible methionine + cysteine per day, the hens should be able to maintain peak output. The quantity of feed chickens need will depend on large differences in home temperature. The optimal range for indoor temperatures is between 21 and 22 °C. In order to account for environmental variables outside of this range, feed limits may need to be changed.

Because it allows for predicting of peak output and post-peak persistency, monitoring bodyweight increases from the beginning to the top of production is a useful indication of feeding program management. Peak output is influenced by body weight, homogeneity, and the feeding schedule throughout the raising phase. Measuring the weight growth of females from the start of lay to the peak of egg production serves as a useful benchmark. Beginning of

lay is defined as 0.5% to 3.0% of weekly output. When a female's weight is between 5% of the normal range and up to 15% above or under, a bodyweight increase of 13 to 15% is employed. Feed quantities may be calculated using the average bodyweight from the previous week if the production in the first week is more than 3%.Increases in output over the first three weeks are a reliable sign of peak production and persistence. The table provides an example of four sexually synchronized, high-performing flocks with maxima of 88%. The table illustrates the output increases necessary for reliable peak production. Flocks with an average start of 1 to 3% weekly output should quadruple production from the second to the third week and increase production by a factor of ten from the first to the second. This will show that flocks have strong sexual homogeneity. Flock D in the chart is similar to Flock A, except Flock D begins production one week sooner. All flocks should, in general, have weekly production performance levels over 80% by 28 weeks.

Reduced feeding after post-peak feeding

Broiler breeder chickens are inclined to gaining too much weight and meat, which might damage their ability to lay eggs and their ability to reproduce. Being overweight may make it more difficult to enter the nest boxes, which might lead to an increase in the number of floor eggs. Peak output occurs when the average percentage of production over the previous five days starts to decline. To sustain hen performance, the daily meal volume must be decreased. To detect minute changes in the hens' body composition, condition, and fat reserves, regular handling and weighing of the chickens is required. Additional factors to take into account when setting the feed reduction schedule include cleaning time, which is typically 1.5 hours for crumble feed and up to 3 hours for mash feed. A flock that finishes the daily ration faster could not be getting the nutrition it needs and might be starving. Early feed withdrawal after the peak may have a negative impact on productivity. In peak output, cleanup periods between 3.5 and 4.0 hours will result in overweight birds, poor uniformity, and extra feed quantities. Extended cleaning times may also cause birds to selectively feed, leaving the finer particles behind. Loss of performance and consistency will result from this. Additionally, since vitamins and minerals may be included in fine feed components, selective eating may lower consumption. It could be thought of withdrawing feed at a high rate.

CONCLUSION

In conclusion, A crucial first stage in the effective transfer and production of poultry is housing preparation. Poultry producers may provide their birds a safe and ideal living environment by following best practices in cleaning, maintenance, and environmental management, laying the groundwork for a fruitful and healthy production cycle. The importance of house preparation for the transfer and production phases of chicken farming cannot be overstated. The need of diligent house preparation in assuring the success of each new flock and the long-term viability of poultry enterprises is reiterated in this conclusion. A clean and disease-free environment is created inside the chicken house by cleaning and disinfection operations, maintenance, and repair work. These precautions not only lessen the chance of disease transmission but also increase the useful lifetime of infrastructure, resulting in long-term cost savings. In order to provide birds a cozy and clean-living place, environmental modifications such as litter management, temperature control, and strict biosecurity controls are essential. Preparation is a key element of successful poultry farming since the combination of these variables supports the flock's health and well-being and adds to their productive performance. Poultry farmers may improve bird welfare, boost production efficiency, and guarantee the long-term profitability of their operations by giving priority to certain pre-production steps. In the end, good housekeeping helps the poultry business satisfy the rising demand for safe and wholesome chicken products.

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CHAPTER 8

ANALYZING THE HEN FEATHERING DURING PRODUCTION

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ABSTRACT:

Hen feathering during production is a critical aspect of poultry farming that directly impacts the welfare, health, and egg production of laying hens. This abstract provides an overview of the significance of proper feathering management during the laying phase, highlighting its importance in maintaining hen comfort, egg quality, and overall flock performance.Feathering management encompasses various practices, including monitoring feather condition, addressing feather loss, providing appropriate housing and environmental conditions, and implementing effective flock management strategies. Maintaining healthy feather cover is essential for hen thermoregulation, protection against injury and disease, and the prevention of cannibalism and aggressive pecking within the flock.Furthermore, hen feathering quality is closely linked to egg production, as stressed or featherless hens may experience reduced egg output and compromised eggshell quality. Implementing proactive measures to support feathering health is crucial for ensuring the well-being of laying hens and optimizing egg production in commercial settings.

KEYWORDS:

Egg Production, Feathers, Hen Health, Poultry Farming, Production Management, Feather Quality.

INTRODUCTION

Egg Mass: There is a direct relationship between egg mass and body mass. Typically, a heavier body will produce a heavier egg. It may be effective to manage body weight and egg weight by introducing Breeder 2 feed when egg weight reaches 60 g for rapid feather females and 62 g for slow feather females. Breeder 2 feed should always have an energy level that is comparable to or slightly greater than Breeder 1. Consuming energy enables females to create and keep up their egg production.A key measure of production persistence and high fertility is the quality and cover of the hens' feathers. Some of the main causes of fast feather loss in breeder chickens include the following.

Feathing problems in raising because to poor management or a lack of critical amino acids in the feed for pullet growers. When feed cleaning time is really quick between 20 and 27 weeks, there is not enough feeder space. Feed distribution when the lights are on, which causes congestion in some areas of the home, including those near the distribution hoppers. Additionally, this could cause ladies to scrape their thighs. When food is distributed when lights are on, chickens will race along the feed tracks, which might stress them out and cause internal lay or egg peritonitis. At photostimulus, low conditioning and fat stores are present. When production is at its height, these females may already exhibit increased feather wear[1], [2].

After 40 weeks, bigger females will be affected by a stringent feed restriction grill. These females may struggle to consume enough feed, which will cause a decrease in production and perhaps even molting. The tight grill may cause their heads to enlarge and lose some of their feathers. This swelling should not be confused with pneumovirus or swollen head syndrome.

The way hens react to light is a complicated issue. Modified lighting programs may be needed, which should be addressed with your Cobb Technical Service specialist depending on local circumstances and house types.Beginning at 21 weeks, or between 147 and 154 days of age, photo stimulation is recommended. The first egg usually hatches in 14 to 16 days, and it takes another 7 days to attain daily production levels of 1 to 2%. Birds shouldn't ever suffer a reduction in day duration throughout the production cycle after light stimulation has taken place. In open residences or spaces with transparent curtains, sunrise and sunset should be blocked out by artificial light. Through week 30, flocks that begin production at 24 weeks exhibit cumulative increases in hatching eggs. If they endure well and have minimal mortality, these flocks are often the most productive flocks. At photo stimulation, the lengthening of bird exposure to light is more significant than the strengthening of the light[3], [4].

Normal production light levels are kept up to stimulate bird activity and allow keepers to do regular house inspections and bird and litter control tasks. Reduce the light level from 70 to 35 lux as a safety measure to minimize culling or death brought on by cannibalistic behavior. After photo stimulation, light intensity decrease shouldn't impair production performance but may have an impact on males' sexual maturity. In order to achieve proper sexual development, males are more sensitive to light intensity.

With the benefit of a much-reduced energy cost, LED lighting has shown its ability to produce parent stock just as well as the conventional light sources. High pressure sodium lights may save energy expenses by 40% over a five-year period when compared to incandescent lights. However, over a five-year period, compact fluorescent and LED lights may save expenditures by 63% and 73%, respectively.Currently, LED lamps/tubes or strings make up the majority of new lighting installations because of their low energy consumption, extended lifespan, dimming capability, and customizable color output. They also offer a high Ingress Protection rating and are simple to wash, sanitize, and disinfect.The management of breeders has been significantly impacted by LED lighting. With the advent of dimmer devices, it is now feasible to handle the birds while working in rearing with low light intensity outputs of 2 to 4 lux. To keep the birds quiet and better prepared for visual stimulation when they are 21 to 22 weeks old, dimming capability is crucial in upbringing. Additionally, operating lights at a reduced intensity has a significant effect on energy use.

Imaging Stimulation

Because they reproduce seasonally, broiler breeders are very reliant on illumination signals for daily and reproductive activity. Before reproduction can start, these birds must wait for 20 to 21 short-day weeks. Given that the birds are physiologically ready during this stage of development, prolonged exposure to light may enhance the reproductive process. To realize one's full genetic potential for reproduction, one must, however, attain both the maturity stage and physical condition. Overfeeding and lengthy photoperiods before young birds are ready can hasten maturation, delay the commencement of lay, increase mortality and double yolks, and cause slower rises in daily output to peak. In order to prevent the birds from sensing seasonal photoperiods and guarantee sexual consistency at the commencement of production, broiler breeders should ideally be raised in lightproof housing. When the lights are turned off, the housing should be entirely dark. A sufficient number of light traps must also be placed above fans, perimeter inlets, and the tunnel inlet[5], [6].

Dark Producing Facilities

In production facilities that are gloomy or in areas where the length of the natural day is less than 14 hours, females may only get a maximum of 12 to 14 hours of light per day. As a

result, there will be strong peak output and persistency, and the female's sensitivity to the length of light will be maintained. A total of less than 11 hours of light will negatively affect productivity. For effective male sexual arousal, the light should have a minimum luminance of 70 lux.

In many enterprises across the globe, brown out configurations are used since there are poor dark out conditions for raising and production. The flock sets their daylight length throughout raising based on the natural day light cycle, which implies that the outside natural light enters the home to a high degree. Supplemental lighting is required in areas near to the equator when the duration of the day is between 11 and 13 hours. The usage of a single day length will be necessary for the duration of the production cycle in high latitude locations where the length of the day in the summer is 15 to 16 hours. It could be required to remove light traps in very hot temperatures if they are used directly on tunnel fans. In this scenario, natural light will enter the home, requiring alterations to the artificial light program to match the maximum duration of the day. Any decrease in natural light might affect how consistently products are produced.

Open-sided housing for animals

The natural light cycle governs lighting schedules in open-sided homes, and any artificial lighting schedule should be modified according to the number of light hours that are absolutely necessary. solely flocks around the equator, at a maximum latitude of 5°, north or south, may often be controlled with solely natural light.

Lighting Schemes

Depending on the housing layouts, there are 3 illumination programs:

1. Raising animals in the dark to produce in the natural light.

2. Dark out production to dark out raising.

3. Brown out rearing to natural sunshine production using natural daylight.

Houses in the dark should provide complete light management. chicks should be exposed to 23 hours of light at first, decreasing to 8 hours at two weeks of age. When feed cleanup times and bodyweights are consistent, the 8-hour day will start. The 8-hour day may often begin 14 to 15 days after the birds finish their daily limited diet in 4 hours or fewer. Until the age of 21 to 22 weeks, when photo stimulation starts, the duration of the day will remain at 8 hours.

When the birds are moved to open-sided production buildings during the summer months with a natural light duration of more than 13 hours, 9 hours of light are employed for raising. Another approach is to utilize artificial light that is increased from 8 to 12 hours per day to photostimulate the chickens in the raising house between the ages of 147 and 154 days. At 154 days old, hens are relocated and given 15 to 16 hours of natural day light to minimize overstimulation. Based on the gap between flocks, this program cannot always be used. During the manufacturing phase, the artificial lighting system must provide 50 to 100 lux, with 70 lux being an acceptable average light intensity for both men and women. For open-sided dwellings, the maximum natural light hours will always depend on the location's latitude. While flocks moved to open production buildings in the summer will need to adapt the maximum light to the local hours of natural daylight, flocks moved in the fall may only get a maximum of 14 hours of natural light.

Natural daylight or brownout raising to produce in the natural daylight. Breeders should not be raised in homes with natural light. However, areas near the equator where the variance in

natural day length is modest effectively use this rearing method. The flocks may depend on natural light throughout upbringing in all seasons till photo stimulation. When the flock reaches the age of 140 days, the program will be dependent on the duration of the natural day. To ensure that the desired day length is reached when the natural day length is inadequate, add additional light at the start and end of the natural day light period. To ensure that the birds are appropriately stimulated during this time, additional light provided must range from 80 to 100 lux.Using a black shade cloth, plastic, or a mix of the two, brown out-raiding homes are covered from the roof down on all four sides. The phrase "brown out rearing" refers to this method, which can block up to 80% of natural light. The difficulty with this method is striking the right balance between airflow and room darkness.In houses located in areas where the natural light hours do not change considerably, brown out raising may be effective. Day length variations will cause a delayed commencement of production in areas outside of 10o latitude north and south, leading to sharp decreases in the number of eggs that hatch.Local day length circumstances dictate that a customized program be established for each flock in open-sided and windowed homes, which may be optimized with the technical services representative. At 140 days old, a recommended illumination schedule for open-sided housing takes into account the duration of the natural day.

DISCUSSION

Increases in light duration and intensity may occur simultaneously with flock homogeneity higher than 70%. A high level of sexual uniformity may be attained and the majority of the flock will be aroused thanks to simultaneous rises. The majority of females will take part in peak production in this manner.Poor consistency increases the risk of overstimulating flock members that are not yet ready for visual stimulation. Unprepared birds that are photo stimulated may produce less at their peak and continue to produce more double yolks, floor eggs, eggs with egg peritonitis, mortality, and culls. Therefore, the flock will need more and smaller gradual increases in light duration and intensity when flock homogeneity is less than 70%. For these flocks, it is advised to start with Increase the brightness to 30 to 35 lux and prolong the light for three hours. Increase light duration by 2 hours and intensity to at least 50 lux one week later. A week later, the intensity should be increased to 70 lux, and the time should be extended by an extra hour.Before mingling, males and females may use the same lighting and photo stimulation program. However, depending on the male line utilized, if males are raised separately, the light schedule for men may vary from that for females. look at the male-specific lighting suggestions[7], [8].

Height guidelines for drinkers

As the birds develop, raise the drinker height so they can lengthen their necks slightly and never have to droop their heads to drink. To get to water, birds shouldn't ever have to leap. They need to be able to stand flat on the ground and drink.

Mineral Composition

Nipple pin placement calls for it to be at chick eye level. After day 2, raise the bird's cage so that its head is at a 45-degree angle to its nipple. Breeders are very sensitive to the presence of particular minerals, whilst being tolerant of larger concentrations of others. Water tends to taste harsh when iron and manganese are present, which may cause less intake. Additionally, these minerals help bacteria flourish. Filtration methods and chlorination are efficient controls if iron is a problem. It is advised to use a filter with a mesh size of 40 to 50 microns to filter the water supply. At least once every week, the filter has to be examined and cleaned. The amount of calcium and magnesium in the water is determined by its hardness. Combining these minerals might result in scale or deposits that reduce a drinking system's

efficiency. Particularly in closed drinking systems, this is true. A system may use water softeners to lessen the effects of calcium and magnesium. Before using a salt-based water softener product, sodium levels should be measured. Even 10 ppm of nitrates might have a negative impact on the breeding success. Sadly, there aren't any practical ways to remove nitrate from drinking water right now. Nitrate levels in water should be checked since high levels might be a sign of sewage or fertilizer pollution.

Oxidation-Reduction Potential value of chlorination

The water's ORP value, which relates to the fact that chlorine sanitizers have a high oxidizing effect, is another crucial consideration. A potent oxidizer eliminates and kills any current bacteria, viruses, and other organic material, rendering the water microbiologically harmless. Water of a high standard has an ORP value of 650 mV or above. The lower the value, such as 250 mV, the higher the organic load, which will likely outweigh chlorine's capacity to effectively disinfect the water.

Contamination by Microbes

A recurring lack of performance could be a sign of tainted water and calls for prompt testing. The total coliform bacterial count should be considered while analyzing water since excessive levels might result in illness. The efficiency of the water sanitation program may be evaluated by counting the total number of bacteria on a plate. Any point in the water distribution system, including the original water source, is susceptible to microbial contamination. Lack of an efficient water sanitation program will easily lead to bacterial development. To guarantee a sufficient water supply during times of high consumption, water storage tanks are often used. Before adding it to the tank, treat the water to stop microbial contamination and development[9], [10].

Dissolved Solids in Total

Total dissolved solids, often known as salinity, is a measure of the number of inorganic ions dissolved in water. Salts of calcium, magnesium, and sodium are the main contributors to TDS. The most often discovered pollutants that have detrimental impacts on chicken productivity are those with high levels of TDS. The total concentration of all dissolved elements in the water, or total dissolved solids, is what determines whether water is suitable for poultry at various amounts.

System cleaning and water filtration

An ongoing program of water sanitation and line cleaning may guard against microbial contamination and the development of sticky biofilms in water lines. While biofilms may not immediately pose a threat to birds, once they have taken hold in water lines, they shield bacteria and viruses from disinfectants. A source of nourishment for microbes, organic material may also be trapped by them. The development of a biofilm may be facilitated by the usage of certain poultry products in water lines. Therefore, after using any of these items, extra care should be taken to ensure that the internal drinking line is clean.

Biofilms in water pipes may be effectively removed using products with hydrogen peroxide. Non-chlorine oxidizers like potassium peroxy-monosulfate are also good in destroying biofilms.A minimum of once a year, general water testing should be done on a regular basis. A sterile container should be used to collect samples at both the well house and the end of a drinking line, and they should be examined at a recognized laboratory. It's crucial to protect the water sample from contamination while collecting it.

Method for Sampling Water

Use an open flame to sterilize the tap or nipple end for 10 seconds. Never chemically sterilize a nipple since the process might alter the sample. Run the water for a few minutes before collecting the sample rather than using an open flame.

Controlling, measuring, and analyzing body weight

In order to raise a flock and keep the birds healthy by the time they are 20 weeks old, there are two suggested feeding methods.

1. Feed in accordance with the breed-specific Cobb bodyweight profile. Be advised that it often takes 2 to 3 weeks for a feed modification to be seen in changes in bodyweight. Therefore, inconsistent bodyweights brought on by frequent diet changes might be confusing, cause stress, and have an impact on flock homogeneity.

2. Feed in accordance with a predetermined and tested feeding schedule and specified feed requirements. The birds are fed in accordance with a schedule, and their bodyweights are maintained between 98 and 102% of the norm. In tiny steps between 1 and 3 g, feed quantities should be changed up or down if the bodyweight deviates too far from the norm. Remember that it takes 2 to 3 weeks for birds with limited access to food to notice a meal modification.

You may combine the two feeding techniques I've outlined. Start by adhering to the first idea, which states that the quantity of feed is governed by the growth of bodyweight throughout raising. The second approach may be used after a suitable feeding profile has been established, simplifying management in general. The success of attaining production goals will increase by using both approaches.

Bodyweight control aims to uniformly raise all of the birds to the desired weight for their age. By regulating feed allowances, bodyweight goals are attained. While during lay they are dependent on these two criteria together with egg production and egg weight, feed levels during raising are based on bodyweight increase and maintenance. Only if the bodyweight is precisely assessed each week may feed quantities be established.

Scaling by Hand

The scales that are used to measure body weight must have a maximum weight capacity of 5 kg and accuracy of +/- 20 g. Scales need to be calibrated often. Utilizing electronic scales that can print results is beneficial. This will help the weighing crew and lessen human mistake. Weigh 3% of the females and 10% of the males at 3 weeks of age, or at least 50 birds, to provide a representative sample. Use a capturing pen instead of picking up and weighing birds at random to improve sample accuracy. Place capturing frames at the front, center, and rear of the barn at predetermined areas. Weights from weekly samples must be indicative of the whole home. Avoid placing a catch frame close to the main hopper area since birds there often weigh more than usual due to feeding on the hopper.

A non-representative flock sample may be obtained when birds are forced into the pen or when birds are caught and put in pens just part of the time. The catch frame should be positioned such that the birds may easily enter the pen in order to get a more accurate representation of the flock. Weigh each bird within the capture pen separately, including the smaller ones, and accept all weights barring sexing mistakes. Release the bird inside the home once each bird has been weighed. Once the pen is empty, keep weighing.Calculate the average weight and the distribution of the flock's weights after recording each weight.

Calculate the quantity of feed to be given to the animals the next days by plotting their average body weight on the relevant chart. Determining if the feeding strategy is effective and maintaining the birds' bodyweights near to average is also crucial.

CONCLUSION

In conclusion, the welfare and productivity of laying hens are strongly impacted by the feathering of hens throughout production, which is a crucial component of poultry management. Poultry farmers may increase the welfare of their hens and preserve optimum egg production by placing a priority on good feathering management via suitable housing, ambient conditions, and flock health initiatives. It is crucial to consider hen feathering at the production stage of poultry farming since it is essential to the welfare and productivity of laying hens. The importance of good feathering management techniques and their wide-ranging effects on chickens and egg production are emphasized in this conclusion. Continuous monitoring of feather condition, quick action to address feather loss, and the supply of acceptable housing and climatic conditions are all components of proper feathering management. Poultry producers may provide their hens with a relaxed and stress-free atmosphere that is essential for preserving their general health and wellbeing by giving priority to these factors. Furthermore, the quantity of eggs is closely related to the quality of hen feathering. Egg production may be reduced in stressed or featherless chickens, and eggshell quality may suffer. In order to maximize the economic viability of commercial egg production, proactive measures to enhance feathering health are crucial for hen welfare.

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CHAPTER 9

A BRIEF DISCUSSION ON METHODS FOR GRADING BREEDERS

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ABSTRACT:

Grading breeders, a process used in the poultry industry to assess the quality and genetic potential of breeding birds, is a critical step in ensuring the production of healthy and high-performing offspring. This abstract provides an overview of various methods for grading breeders, emphasizing their importance in maintaining genetic diversity, improving productivity, and enhancing the overall quality of poultry breeding programs.Methods for grading breeders encompass a range of techniques, including visual assessments, performance evaluations, and genetic selection. Visual assessments involve the examination of physical characteristics and conformation, while performance evaluations focus on reproductive performance, egg quality, and other relevant traits. Genetic selection methods employ advanced molecular techniques to identify and propagate desirable traits.Proper grading of breeders enables poultry producers to make informed decisions about which birds to include in breeding programs, thereby enhancing the genetic potential of future generations. By applying these methods, breeders can consistently produce offspring that meet the industry's evolving standards for health, performance, and quality.

KEYWORDS:

Breeder Evaluation, Grading Systems, Breeder Selection, Poultry Breeding, Genetic Traits, Phenotypic Assessment.

INTRODUCTION

By four weeks, the flock must be at the proper weight and uniformity, with no more than 5% of the animals being overweight or underweight. Correct weights and high uniformity by the time the animals are 4 weeks old will stop significant feed limits or feed quantity increases throughout the maintenance phase. Grading is a crucial technique for increasing consistency. Grading is the act of classifying distinct flocks of birds into groups according to body weight so that each group's individual flocks may be managed back to standard. After weighing each bird individually and computing uniformity, CV, and standard deviations, birds can be categorized. Perform a 100% weighing and grading on the flock between days seven and fourteen. This enables the birds to be sorted according to their weights and feed intake, which manages feed competition from an extremely young age. When uniformity falls below 65% or at 4, 8, and 12 weeks of age, the following 100% flock gradings should be conducted. When compared to their average weight, birds should be divided into three categories: heavy, medium, and light. Age grading must be done right away otherwise the benefit from the first grade will be lost. Examining the outcomes of grading conducted earlier in life, such as at 3, 7, and 11 weeks of age, may be useful. It is obvious that if gradings are completed early, consistency equal to or better than 80% may be attained and maintained. Multiple gradings are not possible in certain areas due to the expense of labor. The ideal age range in these markets, assuming only one grading can be performed, is between 21 and 28 days of age. Grading at this age will give you more time to fix any uniformity problems[1], [2].

No matter how many grades are used in rearing, it is crucial to meet the fundamental management standards, which include: enough space for the feeders, quick feed distribution,

good bird distribution throughout the entire house, consistent weekly feed increases, and enough drinking water with the right water pressure. Males and females are graded using the same system, and males should typically have 5% greater uniformity than females. Only 10% of the flock are males, yet they produce 50% of the young. From 3 to 20 weeks, the average minimum consistency in raising should be over 70%. Towards the conclusion of the raising period, this homogeneity should either remain mostly steady or grow. A flock's uniformity is less than 70%, which means there are problems with feed intake. One of the most crucial times of the day to be present is during feeding. Errors may then be found, and changes can be made right away to ensure that the flock keeps growing evenly.

There are several models available. There is a bigger model that is appropriate for businesses with flocks of over 300,000 people. Pullets may be immunized using this equipment; however, it is cumbersome to transport. Other smaller variants, in comparison, are easily portable and made of stainless steel for cleaning. These more compact devices can only grade chicks and birds up to 20 weeks old. For two gradings, one at three to four and the other at ten to twelve weeks of age, it is often advised to use machines in order to keep the average uniformity of upbringing well over 75%.

The following benefits of automated grading which may be quicker than manual grading, and usually uses fewer people. Model-based capacities range from 1500 to 3000 birds per hour. splits the sorted birds into precise weight ranges and counts the groups of sorted birds accurately. To learn more about the most recent developments, speak with your Cobb representative if further details are required.For manual grading, digital hanging scales are provided. Numerous digital scales include features including the ability to determine average weights, save weights down to the nearest gram, and show histograms of weight distributions. To speed up and simplify sorting, the cutoff values for dividing the flock into groups may be programmed. The last feature of digital scales is the ability to count the birds that were weighed and show the actual number of birds in each group. It is crucial to remember that the feed allocations cannot be computed properly if the number of birds in each group is not precise[3], [4].

Grading system

Sorting birds into three categoriesheavy, moderate, and lightis Cobb's suggestion. A fourth group may be employed, depending on homogeneity and CV. For the purpose of sorting, at least one pen should be left vacant when placing animals in homes with permanent pens or partitions. It is crucial to keep in mind that if birds are transferred to an empty pen during sorting, some litter should be transported from the utilized pen to the empty pen to help the coccidia vaccination cycle. The size of the pen should be utilized to determine the maximum number of birds per pen based on floor, feeder, and drinker space if fixed pens or partitions are being used. The size of these spaces should also be adjusted for movable pens and dividers according on how much room each bird needs for its floor, feeder, and drinker. Sorting birds may potentially lead to greater issues if floor, drinker, and feeder space is not modified to fit bird needs inside the pens!

For reasons of welfare and consistency, stocking density is crucial. Too much ink density might cause uniformity to suffer. Multiple tiny pens may be made in places where labor is easily accessible. In this situation, it is advised to limit the number of birds per pen to 1,000, with 600 to 800 being the best amount. Small enclosures are not useful in homes with 8,000–10,000 birds.There should be a separate feeding system for each pen. Supplemental feeders may be utilized to modify the feed allotments to each pen if this is not practicable.

Sorting and grading procedures

A fraction of the flock has to be weighed before grading. Calculate the average, standard deviation, and uniformity factor (CV). The sorting weights may be established in one of two ways:

As a cutoff, use standard deviation. This will result in 68% of the flock being classified as average, and 16% of the flock being classified as light. 16% of the flock will still be + 1 SD and in the heavy category. For instance, 2000 of a flock of 3,000 birds would be average weight, 500 would be light, and 500 would be heavy. All flocks may benefit from this method, but flocks with low homogeneity may find it to be particularly useful. Without gradings and with proper management, the consistency will typically be between 70 and 72%. For flock homogeneity, dealing with +/- 1 SD will thus seem more natural.

Weight of the Bird Growing

Uniformity curve examples. The weights of the birds in the uniform flock are relatively comparable in the top curve. Poor homogeneity and a broad range of bird weights in the population may be seen in the bottom curve.

1. The table may also be used to evaluate and categorize birds into groups by using a plus or minus 10% computation.

2. Following the computation of the cutoff value. Every bird has to be weighed and placed in the appropriate category. Cutoff values may be programmed into digital scales for each group to speed up and simplify sorting. The number of birds being divided into each category may also be counted using the scales.

3. After sorting, reweigh a sample of the birds from each pen if you are hand weighing them. Determine the homogeneity, variation, and average body weight. Utilize this information to make feed allocation modifications to return the bodyweight to the desired level. In order to ensure that the proper number of birds receives the proper feed allocation after grading, it is also a good practice to count the birds in each pen. One of the most common mistakes made while hand weighing is using the incorrect number of birds per pen.

Strong Light

Weekly weighing should be used to keep an eye on bodyweights. The birds compete for food throughout their whole lives. By dividing the flock into several weight groups and feeding back to a set bodyweight, weight grading at a young age improves control of feed consumption, as was said. After grading, it is typical to see homogeneity within sorted groups exceeding 90%. However, when the pecking order and feed rivalry re-establish inside sorted pens immediately after grading, anticipate uniformity to drop to a usual level of 70 to 72%.

A second sorting and grading should be done if, after the first sorting, the population homogeneity across all pens falls to 65% or below. Identify the causes of the decreasing homogeneity as well. Issues with feed management are often present. A crop inspection may assist in identifying the reasons of low uniformity. As part of a regular technique, some producers grade and sort animals many times during the raising process. Use the same procedure as indicated for further grading and sorting[5], [6].

DISCUSSION

Today's broiler breeders need to design feeding and management plans that enable proper development of the male reproductive system while limiting their growth potential and

capability to deposit breast muscle if they want to achieve optimal hatchability. The most significant element that influences flock fertility is the male development profile. Males should be weighed at least every other week beginning at age one and continuing until 30 weeks.When raising guys, a strong foundation is essential for weight uniformity, healthy organ and skeletal development, and future male fertility. It's critical that the guys reach their Cobb-standard bodyweight goals. Males and females should be raised apart until housing at around 20 weeks of age in order to get the greatest outcomes. Over the course of raising, the bodyweight growth curve has a significant impact on male frame size, with the majority of frame development taking place in the first 12 weeks.

Males should aim for a 7-day bodyweight of 145–150 g on ad libitum feed, but keep an eye on the average daily feed consumption per bird. At three to four weeks, divide the heaviest and lightest males. By 8 weeks of age, make every effort to restore these men' weight back to normal. Male bodyweight might be disregarded, despite the fact that grading men is more crucial than grading women. Preventing large guys and regulating their sexual development will be made possible by limiting bodyweight increase between 12 and 20 weeks. In raising, there should be between 3.6 and 4.3 males per square meter. Beak conditioning should be done in the hatchery. Handle all males at 8 weeks of age, removing those that have evident visual flaws that don't fulfill quality requirements, such as crooked or bent toes, skeletal abnormalities, and beak defects[7], [8].

Preserving Male Equality

The social order is formed between 16 and 20 weeks, and male flocks sometimes lose their homogeneity. Consider an extra fleshing grade at 16 weeks to disrupt the social hierarchy and restore homogeneity with the lighter males. Separate all the males with fleshing scores of 2 or below, and change the diet such that, by 20 weeks of age, fleshing scores reach 2.5. The social order is once again altered when the male and female flocks are combined at 20 to 21 weeks of age. To rate men, think about employing automated grading equipment. It is more accurate and often faster.

In order to assist the guys get used to their feeder system, it is a good practice to move males to the production house 2 to 3 days before the females. This is true for males raised in environmentally controlled homes. As a result, fewer men will take women's food, and body weight management will improve. The ratio of men to females will depend on the breed and sexual synchronization of the males. In general, choose enough men at transfer such that the ratio of women to men is 8 to 9% in homes with slats and 9 to 10% in homes without. For the first matings, only healthy men should be chosen. These men need to be in excellent physical shape and weight. Any males with quality faults or who are exceedingly or severely overweight should be removed and put to death humanely. Keep the remaining population of people with average weights and the men who are somewhat overweight for use in future spiking operations. If the breast muscle is not very massive, which may lead to instability and reproductive issues, a somewhat larger male can be utilized for floor surgeries.

If grabbing a bird by the back, gently grab it by the sides, ensuring sure the wings are tucked in close to the body, and place your fingers on the bird's breasts. With the wings fastened to avoid wing injury, put the birds into the coops. To avoid injuring the hock regions of the legs, catchers should only take birds by the feet while doing so rather than the drumsticks. Never lift, pull, or carry a bird by the wing, one leg, or the neck. It is forbidden to toss birds. It is important to catch birds in a way that reduces their stress and doesn't harm them. Care must be taken to avoid bird harm if coops are utilized. Toe injury might result from coops sliding over the floor. Make sure the coop's top or lid is fastened securely before shutting it to

prevent the heads and wings from becoming entangled.The main cause of overt male dominating behavior is a lack of sexual synchrony. Males begin showing signs of mating activity around 23 to 24 weeks of age, but these females typically begin producing at 25 weeks. Males may be moved a few days after females to regulate and avoid male dominating tendencies if they are much more sexually mature than the females. The ladies will have more time to develop as a result, but the males will need an extra week to become used to their new home following the transfer of the females. Keep the remaining guys in a darker housing until the male to female ratio is 5%.

Managing the disparity in weight between men and women

The bodyweight difference between males and females has significantly decreased during the last ten years, increasing hatchability and fertility levels. The table serves as an illustration of the optimal bodyweight difference between men and girls at various ages. When these levels are reached, the table also provides estimates for fertility and hatchability rates. A healthy balance between testicular growth and male mateability is indicated by high fertility. Although heavy guys may have outstanding testicle size, their fertility will diminish if they cannot complete more than 75% of the attempted matings. Maintain a fleshing score between 2.0 and 3.0 during the manufacturing phase to keep the masculine condition. Using main men that are 11–12% heavier than females has the following benefits:less leg, toe, or bumblefoot issues lead to lower mortality and culling. Females may maintain their feather coating on their backs because to quick and simple mating.

Female Breast Conformation or Male Fleshing

Higher fertility rates are the outcome of females being more amenable to mating. decreases the bodyweight difference between the main and spike men, which increases the success of the male spiking.Although it's uncommon, male flinching in production offers certain distinct benefits that may assist achieve the right bodyweight profile. To keep track of fleshing values between 1 and 5, use the Cobb male fleshing spreadsheet. The spreadsheet computes percentages and the appropriate weighted average for each category when the user enters the fleshing scores for the sample population. Along with the bodyweight, a visual representation of the weighted average flesh score will also be shown. For an electronic version of this worksheet, get in touch with your Cobb Technical Representative.

Separate sex feeding for males

The distribution of a little quantity of feed per male as evenly as possible and maintaining all males with a consistent development and activity level provide challenges for the farm manager and the feeding method used. Use a track system with 20 cm of feeder spacing for males, 8–10 males per round feeder, and 10–12 males per oval pan feeder. For all of the males to eat comfortably, the feeder system's height is crucial. Apply a height that is often quite near to the males' top crop height. Every day, the male feeder line may be lowered to the proper height with the use of a measuring stick that is fastened to it so that all males can reach the pan feeders without female interference. To maintain the proper height of the male feeders, several additional gadgets are available. It is possible to connect a limit switch to the feeder line so that it will turn on when the feeder line is lowered until it reaches the desired height. Maintain the male feeder at a level where the males must slightly extend to consume and where the females cannot reach. A male feeder should never sway and should always be steady. Up to 30 weeks of age, the height must be periodically modified by examining eating behavior at least once per week. Male pan feeders are losing favor in favor of chain or mechanical trough feeders. They also offer some added benefits, such as improved visibility and feed distribution[9], [10].

Sex-Specific Feeding

Separate Sex Feeding is strongly advised for usage in production. Separate Sex Feeding's effectiveness depends on the males' training. The guys must swiftly recognize and use their particular feeders. The optimum practice is to lower the male feeder system or to begin the distribution of male feed after both sexes have entered the production building and started the female feeder. Feed distribution in the dark allows for simultaneous feeding, although females have access to their feeders roughly a minute before males do.

Male-specific meals may be used when feeding the sexes separately. In the business, male diets are often employed. Furthermore, studies and field findings support the idea that male diets increase fertility. Male diets with reduced protein content, 2700 kcal of energy, and 0.5% lysine that is readily accessible regulate male bodyweight and breast muscle development. It is even more crucial that the SSF system keeps females from using the male feeder when there are particular male rations available. In accordance with true SSF, men shouldn't have access to female feed, and vice versa. SSF has a separate line of pans, troughs, or tube feeders for the men in addition to a male exclusion device attached to the female feeder. There should be a horizontal and vertical limitation made by the exclusion grill. Adjust the vertical limitation in systems that use a roller bar or wooden board-plank. Frequently, boards may be adjusted to a height of 42 mm, 46 mm, or 50 mm. Start with 42 mm at 21 weeks, then bump up to 46 mm at peak output, and lastly, at about 50 weeks of age, raise to 50 mm.Spiking is the practice of introducing young broiler breeder males into a more mature main flock in order to make up for the fertility drop that typically takes place after 45 weeks of age.

Having a spiking program in place before fertility declines consistently yields the greatest benefits, according to flock statistics. Historical flock data is often useful in determining when to spike a flock. The hen flock should be between 35 and 40 weeks old for best outcomes, and spiking may be carried out using regularly planned management operations. Typically, one spike over the flock's lifetime is adequate. However, it is reliant on the caliber of the main males and flocks increased twice in an 8–10-week interval. When the females in the flock are older than 55 weeks, spiking is often not financially advantageous. As males try to create a new social structure, improper spiking may cause a reduction in fecundity and hatchability. Several weeks after spiking, improper management techniques might cause the complete loss of the spiked males. Make sure to meticulously track the removal of primary males and keep an eye on the ratio of primary males that are still present so that spike males may be inserted as necessary. It is a good idea to remove any guys from the flock each week who are unable of reproducing so that there are only the most active and prolific males left.

Intra-spiking

To encourage mating, intra-spiking includes moving 25 to 30 percent of the prime males around homes on the same farm without bringing in any additional young males. Similarly, to spiking, intra-spiking performs best when carried out early in the production cycle. Always, intra-spiking between 40 and 48 weeks yields the greatest outcomes. After intra-spiking, mating activity should considerably rise and persist for six to eight weeks. The males swapped often have comparable weights and maturities to the original males, which increases their chances of succeeding in competition. They are also previously educated in mating. For two weeks after mixing, intra-spiking makes male dominance more pronounced as the social order is restored. Male or female death often poses no issues. After intra-spiking, hatchability does not significantly increase, but its persistency is enhanced. Expect an increase in the flock's overall hatchability of 1 to 1.5% with a twofold intra-spiking treatment. Intra-spiking

seldom poses a biosecurity issue, is affordable, simple to execute, and most importantly, is straightforward to do.The graph below shows how flock spiking increases the proportion of eggs that hatch and survive to 60 weeks of age. In this illustration, a flock that was intra-spiked at 40 and 48 weeks of age is contrasted with a flock that had not been spiked. The average hatchability of the flock was 84.5% for the non-spiked flock, 85.8% for the intra-spiked flock, and 87.4% for the flock spiked at 40 weeks.

Handling Eggs

Only when the egg is kept under ideal circumstances between laying and setting in the incubator will the egg be guaranteed to hatch and produce chicks of the highest grade. Its hatching potential can only be maintained once it has been deposited, not increased. Hatching potential will swiftly degrade if treated improperly. Clean shavings should be used to maintain manual nests. The nests must be immediately cleaned and new nest material must be added in their place if there are any droppings, broken eggs, or filthy materials. If nests are overstuffed, early production chickens have a tendency to scrape the shavings out. Hens like to build concave-shaped nests, which may be accomplished by adding shavings inside to make the nest more enticing to the hens. After the start of lay, frequent flock wandering is an excellent management strategy to reduce floor eggs. Birds seeking for nesting locations on the ground or in the corners of the house will be disturbed while the flock is being walked, which will encourage them to utilize the nest boxes. In the nest, egg temperatures may resemble those in an incubator, especially in warm weather. Therefore, to decrease pre-incubation and embryo development, eggs must be routinely retrieved and chilled to storage temperatures. This will increase hatchability and lower embryonic mortality. It is important to plan when to remove eggs from mechanical nests to reduce the chance of pre-incubation. Hatching eggs should be collected in the morning, and house and bird care, as well as repairs and maintenance, may be done in the afternoon.

Hands should be washed before and after touching floor eggs as well as before and after each egg collecting. Eggs should be manually collected at least four times each day, and six collections are advised during times of high production.To avoid cracks, handle eggs carefully at all times. Eggs should be gathered in fiber or plastic trays. Egg trays should only be stacked and carried at a maximum height of three layers when carried by hand. Useless containers like baskets and buckets result in fractured and tainted eggs. When using mechanical devices, prevent eggs from building up on collecting tables. Set the system's speed so that egg collectors may comfortably work at it. When gathering eggs manually, seal the lower nests before the last round and leave the top nests accessible. Close the top nest after the last gathering to keep the nest tidy. When using the automatic communal nest, be sure to open the nests an hour before the lights come on and shut them 12 hours afterwards. The use of floor eggs poses a hygienic concern and reduces hatchability. Never place floor eggs in nesting containers. Separately gather, package, and label floor eggs from nest eggs. If floor eggs are to be raised, they should be raised and hatched in equipment specifically designed for raising floor eggs.

CONCLUSION

In the poultry business, grading breeders is a vital procedure that has significant effects on the caliber and effectiveness of breeding programs. This conclusion emphasizes the value of using a variety of grading techniques to evaluate and enhance the genetic potential of breeding birds. Visual evaluations, performance assessments, and genetic selection techniques all provide distinct perspectives on the caliber of breeders. While performance evaluations concentrate on reproductive performance and egg quality, visual assessments aid

in identifying morphological features and conformation. Genetic selection methods increase the genetic variety of breeding flocks by identifying and propagating favorable features using cutting-edge molecular technology. Poultry farmers may choose breeding stock with confidence thanks to an efficient grading system for breeders. Breeders are able to continuously produce offspring that match the changing industry requirements for health, performance, and quality by giving preference to the inclusion of birds with greater genetic potential.

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CHAPTER 10

BREEDER FARM CLEANING AND DISINFECTION PROCESS

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ABSTRACT:

Cleaning and disinfection practices in breeder farms are crucial components of poultry management, playing a pivotal role in maintaining flock health, productivity, and biosecurity. This abstract provides an overview of the significance of thorough cleaning and disinfection in breeder farms, emphasizing their importance in preventing disease outbreaks, enhancing hatchability, and ensuring the overall success of breeding operations.Breeder farm cleaning and disinfection involve a systematic approach, including the removal of organic matter, thorough cleaning of facilities and equipment, and the application of appropriate disinfectants. These practices help eliminate pathogens, such as bacteria and viruses, that may compromise the health of breeding birds and impact the quality of hatching eggs.Effective cleaning and disinfection procedures not only reduce the risk of disease transmission but also contribute to improved hatchability rates, as clean and sanitized facilities provide a healthier environment for developing embryos. Maintaining biosecurity measures throughout these processes is essential to prevent the introduction of pathogens from external sources.

KEYWORDS:

Biosecurity, Breeder Flock, Cleaning Protocols, Disinfectants, Disease Prevention, Farm Hygiene, Pathogen Control.

INTRODUCTION

By linking the homes with a centralized egg packer, several big parent stock businesses with communal nest systems are further automating the farms. A variety of hatching egg collecting capabilities are available on centralized egg packer machines. A 30,000–40,000 parent stock farm is thought to have enough space for a 10,000 HE/hour machine. A 60,000–70,000 parent stock farm is thought to be large enough for a 15,000 HE/hour machine[1], [2].Every day, the whole egg packaging process should take between 4 and 5 hours to complete. If the egg belts total 50 cm in width and there is a gap between the 2 egg belts, just use the egg packer once per day to reduce system wear. Consider at least 2 to 3 egg harvests every day to minimize eggshell cracks and microfractures if the egg belts are not separated and are smaller. In this situation, eggs must be wrapped and put into the egg storage chamber 2 to 3 times daily.

When to harvest eggs

The time for egg collecting provided here is just a guide. The egg collecting equipment manufacturer can provide you further details on modifying egg belt timing and speeds. Egg belt speeds are also changeable.The following idea is only effective in preventing pre-incubation of eggs on egg belts when the indoor temperature is below 22^0C. Since each home is collected in turn, the time it takes to collect the preceding house delays the start of collection in subsequent houses. As an example, the furthest home collecting begins seven hours after the lights go on. After waiting 45 minutes for the eggs on the belt to go past the next home, the second residence will start collecting eggs. The total time since the lights were first switched on is now 8 hours and 40 minutes when the third residence begins gathering eggs. The time will cause close to 100% of the daily output for succeeding houses to be on

the belt. Eggs are often being gathered in the first and second homes as production progresses. In this situation, following the initial collection, these houses may still hold up to 10% of the daily output. As a result, the first and second home are collected following the initial collection from all the houses. The majority of the daily egg production ought to be gathered during this second collection. A second round of collection may be carried out by speeding up the belt in order to gather all of the eggs in 10 to 12 minutes because the first round of collecting was completed before all of the eggs were deposited.

Weighing eggs

To trace the construction of each particular home, leave a distance of several meters between the last egg of one house and the first egg of the one after it. Before the eggs are put on the connector belt, it's a good idea to install an egg counter at each home belt exit. The second collection starts with the first homes that still have some eggs on the house belts after the initial collection from all the houses. The majority of the daily egg output need to be gathered during the second collection. More than 90% of the eggs that will hatch during the first eight hours of the lights being on will have been laid by birds[3], [4].

Weighing a sample of eggs each day to determine the trend in egg weight has several benefits. An early warning of potential issues will be provided by the examination of this trend, which serves as a good reference for flock performance.The body weight of the females during photo stimulation, the development between 21 and 25 weeks of age, and the degree of female obesity after peak production all have a role in determining egg size. Delays in photo stimulation will initially and throughout the course of the flock's life result in bigger eggs. The average hatchability of the flock may be significantly impacted by eggs that are above 70 g since they often hatch poorly. After 50 weeks of age, hatch begins to drop more quickly, and this is probably the cause.

When our recommendations for bodyweight, feed levels, and feed specifications are followed, the egg weights in the Cobb supplements should be what may be anticipated from typical parent flocks. The second egg collection, which often takes place around mid-morning, should be followed by a bulk weigh of at least 90 eggs in the egg collecting room. Make careful to leave out broken, deformed, and eggs with two yolks. Daily egg weights displayed on a graph will reveal any possible issues that need to be looked at right away. Please see the Breeder Management Supplement for information on the recommended egg weights for each product.

Automatically weighing eggs

Many packaging equipment for eggs weigh each egg. To avoid the loss of hatching eggs, the scale must be calibrated on a regular basis. To avoid bigger eggs being confused for multiple yolks during the first eight weeks, the maximum weight must be changed twice weekly. The effects of a 1 g variation in maximum weight may be significant. Set the hatchery's minimum weight requirement every time.

Control of Egg Weight

In the final stages of production, it's critical to preserve egg weights since weight affects eggshell quality, hatchability, and chick quality. According to research and field observations, when the hatchers are not sufficiently cooled, eggs weighing above 70 g tend to hatch less slowly and have a higher late embryonic fatality rate. As long as you can, try to keep the average egg weight below 70 g! Egg weights often grow throughout production, but beyond 35 weeks of age, increases should be limited to 1 gram every 2.5 to 3 weeks. Between 55 and

60 weeks of age, the average egg weightshould be around 70 g.To regulate egg weights, utilize the following suggestions. Control female bodyweights throughout and after the reproductive cycle. This entails accurately lowering the feed after the peak and controlling and optimizing peak feed quantities. When the egg weights in Cobb FF and Cobb SF reach 60 g and 62 g, respectively, switch from breeder-1 to breeder-2 diet. Cobb advises using just B-1 and B-2 feeds because, with the right decrease in feed volumes, the weights of the hens and the eggs should be kept under control. Start the project on schedule. When production starts at 24 weeks as opposed to 25 weeks, it will take a hen longer to attain a 60 g average egg weight. In general, a lower egg weight at 30 weeks predicts a lower egg weight at 40 and often 50 weeks of age.

Egg Sanitation

Sanitizing hatching eggs may be advantageous in certain situations. Alternatives include using peracetic acid. To stop bacterial penetration before the cuticle hardens, hatching eggs on the farm should be fumigated or disinfected as soon as feasible. The cuticle will be damaged if eggs are scraped, rubbed, or washed, and the physical and antibacterial barrier will be destroyed. Instead, eggs should be treated with chemical-based antimicrobials. Liquid sanitizers should not be used to moisten hatching eggs. This process will only work as a viable method to decrease contamination at low humidity levels. The eggs should be sterilized as soon as possible since the eggshell permeability rises after 24 hours and makes the eggs more vulnerable to bacterial invasion. Eggs should thus be sterilized in the hatchery as soon as they are received if fumigation or disinfection on the farm is not feasible.

Grading eggs

Rejected eggs should be kept far away from eggs that are hatching. Hatching eggs must be carefully placed onto the transport tray with the little end facing down. The egg handling area has to be maintained tidy and spotless. Particularly with elderly flocks, nest pads in automated nests should be maintained clean. Keep the egg store's vermin population under control.It is beneficial to keep the egg handling room colder than the laying house but warmer than the egg storage room since it is the initial step of egg cooling. To avoid mechanical harm to developing eggs, care should be used while grading eggs. Eggs that are unfit for hatching should be removed and discarded, including those that are unclean or soiled, as specified by business policy. depending on hatchery policy, a little crack enormous or double yolk shoddy shell quality, severely distorted.

Quality Eggshell

Almost half of eggs are thrown away because of poor shell quality. For broiler breeders, a light brown or white tint might be the first sign of a low eggshell quality. When eggs are pale, cuticle deposition and calcium buildup are probably declining or incomplete, which may be caused by malnutrition or sickness. In certain instances, problems with eggshell quality are brought on by early oviposition. Over the course of a flock's life, shell strength and thickness should be checked as important parameters. A number of tests may be used to gauge shell quality.

The breaking strength, shell weight, and thickness are examples of destructive techniques. On-site measurements of shell weight and thickness are simple to do. For each flock, 30 eggs should be sampled. Since floor eggs are more likely to be thrown away, choose relatively clean floor eggs as opposed to nest eggs.

Keeping eggs

Before placing eggs in egg storage, they should be given time to progressively chill down. The eggs should be kept in a climate-controlled egg storage facility with a relative humidity of 70%. The Cobb Hatchery Management Guide should be used for long-term egg storage. Always maintain daily records of the egg store's highest and lowest temperatures as well as its relative humidity. Three measurements every day are recommended. It's crucial to take measurements at regular intervals throughout the day.

Depletion

A parent stock flock typically lives for 60 to 65 weeks, depending on a number of variables including as the state of the market, flock productivity, fertility, and hatch rate. Economics, which takes into account the cost and possible profit of the flock, is another factor that influences the depletion time. The length of time the flock remains in the rearing or production unit is set when brooding and rearing are separated from the production house. Before a new flock is put, this rotation scheme mandates that the housing be cleaned and sanitized. One production unit may be supplied with flocks coming from two rearing units thanks to the rotation program, which also offers the lowest housing investment costs and allows employees to be allocated to either rearing or production. The timing of depletion is more adjustable when a single house is utilized for brooding, raising, and laying than it is with a rotating scheme. If the flock is still producing exceptionally well and/or there is a large demand for hatching eggs, depletion may be postponed using the single house method. The flock is not moved using this approach, which also removes the stress brought on by a move, which lowers the biosecurity risk. When it is decided that the flocks need to be reduced, the birds are often sent to a processing facility. Water is provided up until the capturing team shows there; feed is removed on the processing day.

According to best guidelines, a feed withdrawal time of 8 to 12 hours may empty the intestines under typical circumstances while maintaining the strength and integrity of the intestines. To reduce rips and breaks during processing and the possibility of contamination during the evisceration process, maintaining intestinal integrity is crucial. Intestines weaken and become more brittle after 12 hours of fasting, increasing the possibility of intestinal contents contaminating carcasses. Before starting to catch, feeders, drinkers, and other moveable equipment should be lifted or taken out of the water. Slats and nest boxes often stay in place while capturing takes place. Barriers are utilized to split the birds into smaller groups inside the scratch area, preventing stacking and congestion. Catching may be done by the legs or the back. Our Cobb Processing Guide, which is accessible at https://www.cobb-vantress.com/resource/management-guides, provides comprehensive information on these techniques as well as other aspects of capturing, transporting, and processing.

DISCUSSION

The most crucial element in sustaining the health of chickens is basic cleanliness. Starting with disease-free chicks is tremendously helped by healthy parent flocks and clean hatcheries. In order to develop and maintain a healthy breeder flock throughout the production phase, farm cleanliness is crucial.A minimum of 28 days should pass between the previous cleaning and the first-time birds are placed inside the home. Conduct routine biosecurity inspections at every farm. To make sure that the whole facility complies with the company's standards for cleanliness, disinfection, and biosecurity, it is crucial to audit it.The procedure for cleaning and sanitizing involves multiple phases. First, dry cleaning is carried out, which is the actual removal of dirt, dust, and other debris using tools like tractors, blowers, and brooms. Then, using water and detergent, wet cleaning is performed to lessen or

remove material that has been stuck to surfaces and in awkward to reach areas. The chicken house is next sanitized to decrease and eradicate bacteria that might pose health risks to the incoming breeders after all surfaces have been thoroughly cleaned and cleared of dirt[5], [6].

Preparing the home and cleaning beforehand

1. Before cleaning, make sure the home is absolutely vacant.

2. Diseases are carried by insects. The best time to implement an insect eradication and control program is when the home is vacant yet still warm. Spray a broad area around the building with a pesticide that has been certified both inside and outside). The outside treatment is crucial because, when a structure cools, insects will seek for areas to hide and hibernate, making removal more challenging. Following pesticide application, the building should be closed for three to four days. After the disinfection procedure is finished, severe bug infestations can call for an extra pesticide spray.

3. Use bait stations and rodenticides that are lethal after a single dosage following housing depopulation. To encourage rats to visit the bait stations, all feed should be withdrawn from feeders. Both inside and outside the chicken buildings, bait stations should be set up. During the cleaning procedure, continue the rodent control program.

4. In sealed trucks, gather and remove trash from the flock. If a disease or bug epidemic affected the preceding flock, bury or burn the litter.

5. Perform upkeep and repairs on surfaces, such as equipment, door frames, broken panels, and floor cracks.

6. Place all leftover feed from the cross augers, feed bins, and feeder lines/tracks in bags. Clear the area of any packaged feed.

7. Feed silos and bins need to be meticulously cleaned and fumigated. Before refilling feed bins, make sure they are entirely dry to avoid caking and the spread of mold.

8. To protect it from the washing process, dry clean any equipment that cannot be cleaned immediately.

9. Using power air blowers or a vacuum cleaner, clean the electrical panels in the control room.

Air drying

1. To reduce the possibility of re-contaminating previously cleaned areas, all cleaning should start with the top surfaces and go lower[7], [8].

2. Take away and throw away any paper goods related to the preceding flock. These things cannot be adequately disinfected. All moveable fixtures, slats, and fittings should be taken apart, moved from the structure, and gathered outside the chicken house for cleaning. In certain areas, when trash and animal waste have been removed, some of the equipment may be cleaned inside over the winter. Parts of mobile community nests are often cleaned and sanitized within the home.

Damp Cleaning

1. Use a pressure washer to apply a general detergent to all interior surfaces of the home and fixed equipment. Next, open all drainage covers and water runoff paths.

2. All detachable fixtures and equipment should be removed from the structure and submerged in a pit or tank of clean water. They should be cleaned with a power washer after soaking.

3. To reduce the possibility of decontaminating previously cleaned areas, all cleaning should start with the top surfaces and go lower. The optimal drainage path or the floor's slope should be followed while washing the home.

4. Apply the foam or gel detergent and let it soak for the prescribed amount of time to give it time to do its job. If there are ceiling fans, wash them first. Always wash from the ceiling to the floor.

5. Prevent standing water near the chicken coop by installing enough drainage and dirty water collecting tanks that comply with local environmental standards on each farm.

6. Thoroughly wash the ends of the house and any outside concrete surfaces.

7. Cleaning the inside and outside of the curtains as well as avoiding dirt buildup in the curtain pocket should get extra care in homes with curtain sides. To eliminate any organic debris from between the ribs or fins, pay particular attention to the light traps at the intake and fan end.

8. To clean the fan shafts and air inlets, use the pressure washer on the outside of the home. Washing out the dust that gathers in the gutters and on the roof is a good idea. Be warned that blades, aluminum shutters, and other delicate materials are susceptible to damage from high pressure water. Use high water pressure with caution. Wooden communal nests may be harmed by high water pressure and cannot be high pressure cleaned.

9. Detergent cleaning of header or storage tanks for water is required. Before applying cleaning solution, properly drain the header tank and drinking system.

10. Drinking systems should be emptied, primed with a hydrogen peroxide solution that has been authorized to remove any biofilm, and then flushed with high pressure. Use an acid-based solution to remove scale deposits, then flush with high pressure thereafter. To minimize debris buildup throughout both processes, all nipples should be engaged. Finally, run a sanitizing solution across the whole system. As disinfectants may interfere with the administration of live vaccinations, be sure all traces of them are eliminated[9], [10].

Disinfectants

Contact lasts until the applied solution is dry for the majority of disinfectants, which are dissolved in water. Foaming disinfectants may prolong the antibacterial activity of the disinfectant since it takes longer to dry after foaming. Detergent cleaning may cut the bacteria burden by 80%. An extra 20% of the microbial burden may be eliminated using disinfectants. Disinfectants won't work, however, on grimy surfaces. Before using disinfectants, all surfaces must be well cleaned. Follow the manufacturer's recommendations for the dilution rate and the temperature of the diluent water since most disinfectants perform best above 20 °C. Cold solutions of disinfectants don't penetrate as well as hot ones do. This is particularly crucial for porous surfaces. No one disinfectant is effective in all situations. The product used should have a track record of success in testing against the appropriate local species. Disinfectants may be rendered ineffective by organic waste, pH extremes, soap residues, and water minerals. It is important to check that the disinfectant won't damage the target surface.

Chemical protection

Employees are required to be informed of any chemical risks that disinfectants may provide. Any personnel using equipment for chemical applications must get proper training. Workers should get knowledge during training so they are aware of the characteristics of each chemical they use, grasp chemical nomenclature, and comprehend chemical safety. When working with chemicals, control measures, such as the use of personal protection equipment, are required to prevent exposure. Safety Data It should be possible to discover danger information about disinfectants and other compounds using sheets and compatibility tables. Chemicals should never be poured into unlabeled containers for storage; all chemical containers must carry the label from the original manufacturer. It is best to handle all substances as if they were dangerous.

Chemical holding

To avoid reactions, separate chemicals in storage by danger class. Chemicals should ideally be kept in separate cabinets. Alcohols and other flammable substances should be kept in a flammable storage cabinet. To avoid leakage and inactivation, chemicals should be kept in the proper containers. Store chemicals at the proper temperature and humidity ranges, among other environmental factors. These storage specifications may be found on the manufacturer's label.

Formaldehyde

Using formaldehyde as a disinfectant may be quite successful. However, since formaldehyde causes cancer, not all nations and areas allow its usage. Before you think of using formaldehyde as a disinfectant, check your local laws. Additionally, there are a number of disinfectants that are quite effective.

Monitoring of the Sanitation Program

It is recommended to do a visual examination and sample for bacteria to assess the efficacy of the sanitation program. Laboratory tests that are both quantitative and qualitative may be used to assess the sanitation program's performance. Although it is not practical to sterilize the facilities, microbiological testing may certify that all unwanted organisms, including Salmonella, have been eradicated. The efficiency of the sanitation program may be supported by a recorded audit that takes into account visual and microbiological tests as well as attention to the performance of future flocks. The following are some essential components of a sanitation monitoring program: For laboratory analysis, a minimum of 10 swabs per home should be collected.

Although a residence cannot be sterilized, the number of bacteria may be decreased. The efficiency of the home cleaning operations is determined by the bacterial counts, or total viable count. There should be no more than 1,000 total viable colony-forming units per cm2 of floor space, and no more than 100 on all other surfaces. After cleaning, no Salmonella should be isolated. Maintain a strict vermin management program that includes a rodent barrier around the exterior of the home or unit.To stop the reintroduction of pests and other pollutants, keep the doors closed at all times. Walls and door cracks should be filled up. Rodents and insects may gain entrance to homes via openings around doors and walls, jeopardizing the flock's biosecurity.

Ventilation Control

The ventilation system must provide ideal temperatures in both cold and hot situations to promote optimum flock performance. The system must maintain consistent and stable temperatures while also managing moisture and air quality in cold weather and during brooding. The ventilation system must have enough cooling capability in hot weather to keep the birds as comfortable as possible. However, the home environment needs continual monitoring and ventilation modifications since it is a dynamic environment with changing temperatures, air quality, and humidity levels.One of the biggest problems a producer could have is controlling the moisture in the litter and the humidity in the chicken houses. In hot weather, high indoor humidity creates two problems: it impairs birds' capacity to regulate their body temperature via evaporative cooling, and it makes it difficult to control the moisture levels in their litter. The difficulty in cold weather is conditioning the entering chilly air before it circulates to bird level. The two most crucial ideas a producer has to grasp for effective control of litter moisture are mixing the incoming cold air with the heat held at ceiling level owing to natural stratification and circulation fans.

Options for installing a circulation fan

A circulation fan system's main job is to spread out the house's natural heat stratification. Up to 5 °C may often be found between the floor and the ceiling. By creating air flow at floor level between 0.25 to 0.76 m/s, these devices are intended to mix the air from floor to ceiling while eliminating moisture from the litter. Circulation fans come in a wide variety of configurations and designs.

Ventilation at a Minimum

Utilizing fans on a cycle timer, minimum ventilation systems are created to control moisture and air quality. The minimal air exchange is tied to the quantity of moisture the birds bring to the home, as well as the drinking, heating, and ventilation systems, and this system is independent of temperature regulation. Most of the time, efficient moisture management should keep the amounts of carbon dioxide and ammonia below 3000 and 10 ppm, respectively. Ammonia levels are always correlated with indoor humidity levels and litter moisture levels. High amounts of ammonia may make the birds more vulnerable to illness and jeopardize their wellness. Additionally, foot health may rapidly deteriorate in birds reared in moist litter circumstances, which can result in pododermatitis.

Three primary purposes of minimal ventilation are as follows:

1. Control of moisture and humidity

2. Give the bird enough oxygen to suit its metabolic needs.

3. Upkeep of ideal litter conditions

Fans Are Necessary for the Minimum Ventilation

The bare minimum ventilation system must have enough power to run continuously during the flock's lifetime. The number of fans needed may be calculated, for example, as follows. The estimations for the minimal ventilation are simply suggestions. On the basis of the humidity and air quality, changes should be made every day. Up until all installed minimum ventilation fans are utilized, the range and capacity of fans to be used for cycle ventilation will gradually grow.

CONCLUSION

In conclusion, Maintaining the health and productivity of breeding flocks requires regular cleaning and disinfection of breeder farms. Poultry farmers may reduce illness risks, improve hatchability, and guarantee the long-term profitability of their breeding operations by following strict cleaning and disinfection methods. Fundamental methods in poultry management, breeder farm cleaning and disinfection have a significant impact on the wellbeing, output, and biosecurity of breeding flocks. The vital significance of these procedures and their function in ensuring the success of breeding operations are reiterated in this conclusion.

The removal of organic debris, complete cleanliness of buildings and equipment, and the use of the proper disinfectants are all components of systematic cleaning and disinfection operations. These actions are essential for getting rid of viruses that can endanger breeding birds' health and the quality of hatching eggs. Furthermore, to avoid the introduction of infections from outside sources and to protect the integrity of breeding flocks, strong biosecurity measures must be maintained during cleaning and disinfection procedures.

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CHAPTER 11

STRATEGIES FOR ENHANCEMENT IN FOOD PRODUCTION: AN ANALYSIS

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ABSTRACT:
Strategies for enhancing food production are vital in the context of a growing global population and increasing food demand. This abstract provides an overview of key strategies and approaches aimed at boosting food production to meet the nutritional needs of a growing world population while addressing sustainability and environmental concerns.Enhancing food production involves a multifaceted approach that encompasses sustainable agricultural practices, technological advancements, genetic improvement, and efficient resource management. Sustainable agriculture, including practices like organic farming, conservation agriculture, and precision farming, aims to minimize environmental impact while maximizing crop yields.Technological advancements, such as precision agriculture, the use of biotechnology, and innovative farming practices like vertical farming and aquaponics, offer new opportunities to increase food production efficiency. Genetic improvement through crop breeding and genetic engineering also plays a significant role in developing high-yielding and resilient crop varieties.Efficient resource management, including water and land use optimization, crop rotation, and integrated pest management, helps maximize productivity while minimizing resource wastage.

KEYWORDS:

Agriculture, Aquaculture, Biotechnology, Crop Management, Food Security, Genetic Improvement, Greenhouse Farming.

INTRODUCTION

A negative pressure ventilation system is the most effective approach to achieve air dispersion with little ventilation. In order to guarantee that the incoming air jet adheres to the roof and reaches the top of the house where the heat has gathered, the pressure drops across the inlets and the amount the inlet is opened should be modified. This information may be used as a reference to figure out the necessary inlet pressure drop. The breadth of the home, the distance the incoming air jet must travel within the house, and the outside temperature will all affect the pressure drop that is chosen. The intake pressure drop and opening size must be raised when the outside temperature is below 5 0C. The temperature differences between the outside and interior of the home determine whether the incoming air jet can connect to the ceiling. To make sure that the incoming air enters the middle of the home, always do a smoke test. Only conduct smoke tests if there is no wind and the outside temperature is much lower than the inside temperature. Smooth, solid ramps of around 3 m need to be erected in front of the perimeter inlets in homes with barriers like purloins or electrical conduit that might block the incoming air jet. To guarantee that the incoming air jet enters the middle of the house in homes with side wall inlets that are lower on the wall, the pressures and inlet holes must be raised appropriately. With the chilly weather outdoors, this is extremely crucial.A 2.5 Pa pressure reduction is needed for every 61 cm the entering air must travel. When the outdoor temperature falls below 5 0C, this will need to be greatly raised[1], [2].

Installation and Management of Perimeter Inlets

Possibly the most crucial element of the home ventilation system is the perimeter inlets. The placement and layout of the inlets will have a big influence on how the entering cold air is directed. Fresh air that enters the home during chilly months mixes with warm, dry air before it reaches the level of the birds. The entering air's temperature rises and its humidity falls as it mixes. One method for controlling the incoming air initially is the perimeter inlets. With them, it is possible to guide the airflow so that it enters the middle of the home where it may pick up heat and lose moisture. The relative humidity will decrease by 50% for every 11 0C or 20 0F rise in temperature[3], [4].

Humidification and compaction of the trash, especially along the side walls, are the most frequent effects of improperly maintained inlets. When the fans are turned off, a properly constructed intake should shut and totally seal. When the inlet is open, air should only enter over the top of it, not from the sides or the bottom. Birds will get chilly and condensation will form if there are air inlets that transmit cold air to the floor via the sides and base. For varying fan capacity, inlet apertures should be pressure-controlled to ensure a steady airflow. Special consideration must be paid to the nylon cords that close the inlets while cables are being used to operate them. Cables have a tendency to stretch and lead to unequal openings. Losses of heat and energy will occur when inlets do not fully seal, particularly when it is windy. The ideal material to use when installing the inlets is an 8 mm steel rod[5], [6].

The minimum ventilation inlets must be sufficiently open to provide the necessary static pressure and air jet. A minimum opening of 2.5 cm to 5 cm is needed, depending on the inlet design, to guarantee that cold arriving air jets connect to the ceiling and detach towards the center. Always light up Test the home in cold conditions or install a sequence of ribbon tapes running from the inlet to the middle of the house on the ceiling. For simple viewing, place these ribbons at an intake near to the control room.The housing must be as airtight as feasible in order to establish a negative pressure system in a controlled environment raising or producing facility. Leaks often occur around the ridge of the roof, next to the fans, at doorways, and along stem walls. The curtains are often the biggest cause of leakage in raising and manufacturing buildings with curtain sides. Close all the inlets to check the efficacy of the house's seal, then measure the pressure decrease across any door or inlet. Turn on a fan with a capacity equal to 0.30 m3/min or the floor area. Over 37.5 Pa of pressure should be measured throughout the aperture. If the pressure is less than 25 Pa, the home is not properly sealed.

Ventilation in Transition

When the home thermostat overrides the cycle timer to enable continuous operation of the cycle fans and the staging of the remaining transition fans to manage temperature, transition ventilation starts to function. Between the minimal ventilation stage and tunnel ventilation is the temperature-controlling step known as transition ventilation. The main goals of transition ventilation are to improve indoor air exchange and control temperature while avoiding raising air velocity or speed over bird level. In contemporary tunnel ventilated homes, the highest airspeeds produced in full transition mode may vary from 25 to 50% of full tunnel ventilation capacity. In tunnel ventilated homes, it is a crucial step of ventilation to promote bird comfort and early feed intake, particularly during rearing. The first week is the starting point for flock homogeneity, which is influenced by early feed intake and temperature control.

Fan capacity necessary for a complete transition

The transitional ventilation system generally consumes 30 to 50 percent of the total tunnel ventilation capacity in conventional pullet and production tunnel buildings. Having higher transitional capacity is advantageous in colder regions. The capacity may also be represented in terms of floor space: air exchange rates of 2 to 3 minutes when in full transition or 1.2 to 1.8 m3/min per m2 of floor area. These fans make advantage of uniformly spaced lengthwise along the house perimeter wall inlets. When under negative pressure, the inlets operate at their best. This system is a crucial component of any ventilation system since it provides great temperature control, lowers the danger of cooling the birds, and decreases odors.

Ventilation in Tunnels

In hot conditions, tunnel ventilation is utilized to cool animals by eliminating metabolic heat from pullets and breeders. The air intake is located at one end of the house, while the tunnel ventilation fans are situated at the other. The temperature that the bird really feels is determined by the wind-chill effect, which is caused by the airflow. The effective temperature perceived may be anywhere between 1 and 8 °C below ambient temperatures and will vary depending on airspeed, bird age, relative humidity, and many other variables. It is important to keep bird effective temperatures below 30 °C.

Keep airspeeds between the ranges shown in the table below throughout the brooding and early weeks of the raising stages to guarantee maximum bird activity and feed intake, unless air temperatures are much higher than the target temperatures for the respective ages. An absolute maximum temperature pickup or difference of 2.8°C from the front to the end of the house on the warmest day should be guaranteed by the tunnel fan capacity or air exchange rate.

Understanding complete tunnel mode negative pressure readings

From the front to the extraction end of the home, the pressure levels will rise. The air movement effort required by the fans to move the air down the length of the home is shown by the pressure measurement at the extraction end. It is the result of the pressure decreases listed below:

1. Pad tension

2. A light-trap inlet

3. Pressure decrease at a tunnel intake curtain or door

4. Pressure during transition or "squeeze"

5. Pipe pressure, which includes obstructions like nest boxes and feed hoppers that cause resistance.

The sixth tunnel fan light trap

The illustrations highlight how critical it is to preserve the proper velocity and negative pressure drop at the tunnel entrance curtain or door. Increased "dead spots" will be caused by pressure dips and very low input air velocity. To assist mitigate this occurrence, the tunnel inlet door or curtain pressure drop must be modified. The flock may experience heat stress if air speeds are not increased, since these places will get hotter.

Mechanical nest boxes for airspeed distribution

The air going down the production house will always choose the route of least resistance while complete tunnel ventilation is operating. Due to the existence of equipment, airspeed dispersion might be difficult in breeding facilities. The airspeed homogeneity throughout the house cross is significantly influenced by the location of feed distribution hoppers and the orientation of nest boxes. The air velocities on the slats of breeder homes of the USA type with a central scratch area are generally 15 to 25% lower than the center air velocity in the scratch area.

Bird-heat removal is greatly reduced at low slat air speeds. Areas with scratches may be much colder. This discrepancy will also rise with an increase in tunnel fan capacity or velocity, with the scratch area always showing the highest gains.On the side walls, avoid utilizing exposed structural supports. Slat airspeeds will be improved by using solid, smooth side walls rather than curtains.

Given the strong correlation between the two, measuring water use using water meters is a great way to determine feed consumption. Avoid using too large meters that need high flow rates to detect consumption, which is particularly important during the first few weeks. To achieve an acceptable flow rate, water meters should be the same size as the incoming water supply line. To identify daily patterns in performance and the health of the birds, water intake has to be monitored at the same time every day. Every 24 hours, water consumption per bird should be noted. Any significant variation in water use should be looked into since it could point to a water leak, a health problem, or a feed problem. A flock issue often manifests itself as a decrease in water intake.

Tanks for storing water

On the farm, sufficient water storage should be available in case the primary system fails. The best water supply for farms is one that can meet their peak 48-hour demand. The amount of water needed for the number of birds needed for the evaporative cooling system determines the storage capacity. Understanding water supply and layout is essential when planning or improving a farm. Each home should have its own cooling system and water supply for the birds. Consider the needs for peak drinking demand as well as the demand for evaporative cooling systems. Storage tanks have to be kept in a separate, well-insulated structure, or else shaded and well-insulated. If a well or holding tank is used as the water source, the supply pump capacity should be sufficient to meet both the maximum water demands of the birds and the maximum requirements of the fogging and/or evaporative cooling systems[7], [8].

Function and Installation of a Light Trap

It might be difficult to design a ventilation system for a rearing home that is ventilated through a dark tunnel. Light traps come in a wide variety of styles and designs, each with a varied capacity for light limitation. The air flow restriction and the light reduction factor do not always match. Some traps with extremely high light reduction rates have very little air flow restriction. The necessary area of the light trap will depend on the desired home air velocity and the fan capacity. Two factors may be used to compare light traps and light filters:

1. Airflow resistance: Static pressure is displayed against the light trap face velocity in m/s or fpm to depict airflow resistance graphically. A lower static pressure will signal a lower air flow resistance when comparing light traps at a certain face velocity.

2. Resistance to light transmission: To replicate direct sunshine, test facilities will set up powerful lights outside the light traps. The outer and inside surfaces of the light traps are used

to gauge light intensity. By dividing the intensity of the light within by the intensity of the light outside, the light reduction factor can be computed. The higher the light reduction factor, when comparing various light traps or filters, the greater the barrier to light transmission. The light reduction factor of the light trap should be at least 2,000,000 to 1. The ideal ratio is more than 10,000,000 to one. Here are some general pointers for managing and installing light traps:

Typically, there are two types of light traps: cellular and blade. Knowing the pressure drop over the light trap is crucial when constructing light traps so that the proper fan capacity can be fitted to fulfill the flock's needs for air velocity. A variety of face velocities will get the anticipated pressure decreases from the light trap source.

Installation and Maintenance of Light Traps

The installed area of the light trap will always affect the airspeed through it. In high-speed tunnel homes, light traps positioned directly above fans will result in a considerable reduction in fan performance. A 150 cm 150 cm or 2.25 m2 light trap may be positioned immediately above a 120 cm fan in a cross-ventilated pullet house. Due to the light reduction factor provided by the evaporative pads and a darkened dog house, when installing both tunnel inlet light traps and evaporative pads in a pullet rearing house, the tunnel inlet light traps may have a lower light reduction factor and lower air flow resistance than those installed at the tunnel fan end. A fake wall that contains the light traps and is built 1.5 meters from the end of the tunnel fan is an effective installation option for the light traps. When the home is not operating in full tunnel mode, this permits air to travel through all light traps, lowering the pressure drop. Installing tunnel fans on the sides of the house with plenum-style rooms for the construction of the light trap fake walls is a solution. Since high-speed raising homes often need more light trap area than can fit within the house cross, this method is by far the most effective.

DISCUSSION

The need to increase food production is urgent given the world's rising population. In our attempts to raise food production, biological principles as they are used in animal husbandry and plant breeding play a significant role. The development of new methods, including tissue culture and embryo transfer technologies, will be essential to raising food production levels.

Livestock Management

The agricultural activity of breeding and rearing cattle is known as animal husbandry. As a result, it is a crucial talent for farmers and combines both science and art. Animal husbandry is the study of caring for and raising livestock that is valuable to people, such as buffaloes, cows, pigs, horses, cattle, sheep, camels, and goats. It is expanded to encompass fisheries and poultry farms. Fish, mollusks (shellfish), and crustaceans (prawns, crabs, etc.) are all reared, caught, sold, etc. in the fishing industry. Since the beginning of time, people have employed animals such as bees, silkworms, prawns, crabs, fish, birds, pigs, cattle, sheep, and camels to produce goods like milk, eggs, meat, wool, silk, honey, etc.According to estimates, India and China house more than 70% of the world's cattle. It is startling to learn that just 25% of the world's agricultural output is produced locally, meaning that the productivity per unit is quite low. Therefore, in order to increase quality and production, innovative technologies must be used in addition to traditional methods of animal breeding and care.

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Agricultural and Animal Welfare Management

A professional approach to what has been conventional methods of farm management increases our food supply in a much-needed way. Let's talk about some of the management techniques used in different types of animal farming.

Milk Production Management

Animals are managed in dairying for the purpose of producing milk and other products for human use. Describe the animals you could anticipate seeing in a dairy. What various goods may be produced using milk from a dairy farm? In dairy farm management, we deal with procedures and frameworks that boost production and enhance milk quality. The quality of the breeds on the farm has a major impact on milk production. It is crucial to choose excellent breeds with high producing potential (given the local climate), paired with disease resistance. The cattle must be well-cared for in order for the production potential to be realized; they must be well-housed, provided with enough water, and kept disease-free. A scientific approach should be used while feeding cattle, with a focus on the kind and amount of fodder. Additionally, when milking, storing, and transporting the milk and its products, strict sanitation and hygiene (across the board for the cow and the handlers) are of the utmost significance. Naturally, a lot of these procedures are now automated, which lessens the likelihood that the product will come into close touch with the handler. Of course, maintaining these strict regulations would call for frequent inspections and accurate record keeping. The earliest possible detection and correction of the issues would also be beneficial. A veterinary doctor would need to make regular visits. If you were to develop a questionnaire on various facets of dairy farming and then follow it up with a visit to a dairy farm in your area to get answers to the questions, you would definitely find it intriguing[9], [10].

Farm Management for Poultry

The category of domesticated birds used for food or for their eggs is known as poultry. They often consist of chicken, ducks, and sometimes turkeys and geese. In a more generic sense, the term poultry may also apply to the flesh of other birds, despite the fact that it is often used to describe solely the meat from these types of birds. Similar to dairy farming, managing a poultry farm involves choosing disease-free and acceptable breeds, maintaining adequate and safe farm conditions, providing sufficient feed and water, and ensuring worker cleanliness and health. You may have read newspaper articles or seen TV news programs about the "bird flu virus," which terrified the nation and significantly reduced egg and chicken consumption. Learn more about it, then debate if the panicking was necessary. In the event that several chickens are affected, how can we stop the virus from spreading?

Livestock Breeding

Animal breeding is a crucial component of animal husbandry. The goals of animal breeding are to increase animal productivity and enhance the desirable characteristics of the products. What kind of people would we breed animals for? Would the choice of animals affect the choice of characters?

What exactly do we mean when we say "breed"? A breed is a collection of animals that are connected genetically and share the majority of their characteristics, such as overall look, features, size, configuration, etc. Learn the names of several popular breeds of chicken and cattle that are raised on local farms. Inbreeding, or breeding between members of the same breed, is distinguished from outbreeding, or breeding between members of other breeds.

Inbreeding

Over the course of four to six generations, increasingly closely related members of the same breed are mated. The following describes the breeding strategy: superior males and females of the same breed are selected and mated in pairs. Superior males and females among the offspring produced by such matings are identified for further matings after they have undergone evaluation. In the case of cattle, the cow or buffalo who produces more milk each lactation is considered to be a superior female. The bull, on the other hand, is a superior male that produces offspring that are superior to those of other males.

Try to remember the homozygous purelines that Mendel created. The development of purelines in cattle follows a similar process as that of peas. Homozygosity is increased through inbreeding. So, if we wish to develop a pureline in any species, inbreeding is required. Recessive genes that cause damage are exposed through inbreeding and are subsequently selected out. Additionally, it aids in the deletion of undesirable genes and the accumulation of superior genes. As a result, this strategy, in which selection occurs at every stage, boosts the production of inbred populations. Inbreeding that persists, particularly close inbreeding, frequently lowers fertility and even production. The term for this is inbreeding depression. When this starts to be an issue, chosen members of the breeding population should be crossed with superior unrelated members of the same breed. Usually, this aids in restoring fertility and yield.

Out-breeding

Out-breeding, also known as cross-breeding or inter-specific hybridization, is the mating of unrelated animals. It may take place between members of the same breed who have not shared ancestors for four to six generations.Out-crossing is the process of marrying animals of the same breed who, for 4-6 generations of their lineage, have no common relatives. An out-cross is the term used to describe the progeny of such a marriage. It is the ideal breeding technique for animals whose growth rates for beef cattle, productivity for producing milk, and other traits are below average. Inbreeding depression is often alleviated with a single outcross.

Cross-breeding

This technique involves mating exceptional males of one breed with superior females of another breed. The positive traits of two distinct breeds may be merged via cross-breeding. The offspring of hybrid animals may also be produced commercially. As an alternative, they may go through some kind of inbreeding and selection to create new, stable breeds that might be better than the ones that already exist. This strategy has led to the development of several new animal breeds. Bikaneri ewes and Marino rams were crossed to create the new breed of sheep known as Hisardale in Punjab.Interspecific hybridization: This process involves mating male and female animals from two closely related species. In certain circumstances, the offspring may combine the desired traits of both parents and may be of great economic worth, such as the mule. Do you know the cross that results in the mule's production?

In controlled breeding trials, artificial insemination is used. The breeder extracts the semen from the male that is chosen as a father and injects it into the reproductive system of the chosen female. The semen may either be utilized right away or frozen and used later. It may also be sent frozen to the location where the female is kept. Desirable matings are carried out in this manner. Artificial insemination aids in our ability to resolve a number of issues with regular matings. Could you name a few of them and debate them? Even if artificial insemination is used, the success rate of mating adult male and female animals is often rather

low.Other methods are also employed to increase the likelihood that hybrids will be successfully produced. One such approach for herd enhancement is multiple ovarian embryo transfer (MOET). In this technique, a cow is given hormones with FSH-like activity to stimulate follicular maturation and super ovulation, in which she produces 6–8 eggs every cycle as opposed to her usual one. The animal is either artificially inseminated or mated to a superior bull. The 8–32 cell stage fertilized eggs are non-surgically retrieved and given to surrogate moms. Another cycle of hyper ovulation may be performed using the genetic mother. For example, this technique has been tested on cattle, sheep, rabbits, buffalo, and mares. High-quality (lean meat with low fat) and female breeds that produce a lot of milk Bulls that produce meat have been successfully bred to quickly increase the size of the herd.

CONCLUSION

In conclusion, in a world that is changing quickly, measures for improving food production are crucial for guaranteeing food security and sustainability. We can solve the difficulties of food production and contribute to a more secure food supply and ecologically sustainable future by adopting a comprehensive strategy that integrates sustainable practices, technology, genetics, and effective resource management. In order to successfully address the worldwide problem of providing enough and sustainable nourishment for a rising population, strategies for improving food production are essential. The multidimensional character of these solutions and their usefulness in addressing both food security and environmental sustainability are highlighted in this conclusion. Precision farming and organic farming are examples of sustainable agricultural methods that encourage resource efficiency and lessen the environmental effect of food production. Technology improvements, such as biotechnology and creative agricultural techniques, provide prospects to boost crop resilience and yields. Crop types that can endure shifting climatic conditions and pest pressures while retaining high production are developed via genetic enhancement through breeding and genetic engineering. Crop rotation, integrated pest control, and other efficient resource management techniques assist increase agricultural productivity while reducing resource waste.

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CHAPTER 12

PLANT BREEDING FOR DISEASE RESISTANCE: AN OVERVIEW

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ABSTRACT:

Plant breeding for disease resistance is a crucial component of agricultural research and practice, aiming to develop crop varieties that can withstand the threats posed by pathogens and pests. This abstract provides an overview of the significance of plant breeding for disease resistance, highlighting its role in ensuring food security, reducing chemical inputs, and promoting sustainable agriculture.The development of disease-resistant crop varieties involves the selection and breeding of plants with natural resistance traits or the incorporation of resistance genes through genetic engineering. These approaches contribute to the creation of resilient crops that can thrive even in the presence of harmful pathogens, reducing the need for chemical pesticides and minimizing yield losses.By harnessing the power of plant breeding, we can address the ever-evolving challenges posed by plant diseases, increase crop yields, and enhance the sustainability of agriculture. The ongoing research and application of disease-resistant plant breeding are crucial for meeting the global demand for safe and nutritious food while minimizing the environmental impact of agriculture.

KEYWORDS:

Agricultural Genetics, Disease Management, Genetic Resistance, Breeding Programs, Crop Protection, Pathogen Resistance.

INTRODUCTION

The upkeep of honeybee colonies for the purpose of producing honey is known as beekeeping or apiculture. It has historically been a cottage business. Honey is a food with a high nutritional value that is also used in traditional indigenous medical practices. Beeswax, which is also produced by honeybees, has several industrial applications, including the creation of different types of polishes and cosmetics. big-scale beekeeping operations have emerged in response to the rising demand for honey; beekeeping is now a well-established source of income, whether it is carried out on a small or big scale[1], [2].Any location that has enough orchards, farmed crops, and natural plants for bee pastures is suitable for beekeeping. There are several honeybee species that may be raised. The most prevalent of them is Apisindica. One may keep beehives in their courtyard, on their home's balcony, or even on the roof. Beekeeping requires little labor.

Although beekeeping is quite simple, it does take some specialized expertise. A number of organizations provide beekeeping courses. The following considerations are crucial for effective beekeeping:Understanding the nature and behaviors of bees, choosing an appropriate place for the beehives, capturing and hiving swarms (groups of bees), managing beehives throughout the seasons, and handling and collecting honey and beeswax are all necessary. Many of our crop species, including sunflower, Brassica, apple, and pear depend on bees for pollination. Beekeeping in agricultural fields throughout the blooming season boosts pollination effectiveness and yield, which is advantageous for both crop and honey production.

Fisheries

Fish, shellfish, and other aquatic species are caught, prepared for sale, or otherwise dealt with in the fishing business. For sustenance, a significant portion of our population relies on fish, fish products, and other aquatic creatures like prawns, crab, lobster, edible oysters, etc. Common freshwater fish species include the catla, rohu, and common carp. Among the marine species consumed are hilsa, sardines, mackerel, and pompano. Find out which fish are most often consumed in your region. In India's economy, fishing plays a significant role. It supports millions of farmers and fishermen with revenue and jobs, especially in coastal areas. It serves as their only means of support for many people. Various approaches have been used to boost productivity in order to satisfy the growing demands on fisheries. For instance, we have been able to boost the production of freshwater and marine aquatic plants and animals via pisciculture and aquaculture. Learn the distinctions between aquaculture and pisciculture. This resulted in the growth and prosperity of the fishing sector, which has significantly increased the income of farmers in particular and the nation as a whole. We now refer to the "Blue Revolution" as being carried out in a similar manner as the "Green Revolution."

Animal Breeding

A little amount of biomass may be produced via traditional farming to feed both people and animals. Only a little degree may more area and better management methods boost production. Plant breeding as a technique has significantly increased yields. Who in India has not heard of the Green Revolution, which enabled our nation produce enough food to not only fulfill domestic needs but also export some of it? Plant breeding methods played a significant role in the green revolution by enabling the production of high-yielding and disease-resistant varieties of wheat, rice, maize, etc. Plant breeding is the deliberate modification of existing plant species to produce desirable plant kinds that are more amenable to cultivation, produce higher yields, and are resistant to disease. Since the dawn of human civilization, conventional plant breeding has been a long-standing activity; the earliest plant breeding evidence dates to between 9,000 and 11,000 years ago. Numerous modern crops are the outcome of early domestication. All of the important crops we eat now come from domesticated variations. Traditional plant breeding includes crossing or hybridizing pure lines, then using artificial selection to create plants with desired features like increased yield, nutrient content, and disease resistance. With advances in genetics, molecular biology, and tissue culture, molecular genetic methods are being used more and more in plant breeding.

Increased crop output and better quality would be the first two characteristics on our list of characteristics that breeders have attempted to introduce into agricultural plants. higher resilience to diseases (viruses, fungus, and bacteria), higher tolerance to environmental challenges (salinity, severe temperatures, drought), and increased tolerance to insect pests would also be on our list. Plant breeding programs are routinely carried out in both public and private organizations across the globe. Breeding a new genetic variation of a crop involves the following key steps:

(i) Collection of variety:

Any breeding program's foundation is genetic variety. Many crops have wild cousins that may provide pre-existing genetic diversity. A need for efficient exploitation of the natural genes present in the populations is the collection and preservation of all the many wild variations, species, and relatives of the farmed species (followed by their appraisal for their features). The term "germplasm collection" refers to the full collection (of plants/seeds) that contains all the various alleles for every gene in a particular crop.

(ii) Evaluation and parent selection:

The germplasm is analyzed to find plants with a desired combination of traits. The chosen plants are multiplied and employed in the hybridization process. Where it is desired and feasible, purelines are produced.

(iii) Cross-parental hybridization:

The required traits are often mixed from two distinct plants (parents), for instance, a high protein quality of one parent may need to be coupled with disease resistance of another parent. By cross-hybridizing the two parents, it is possible to create hybrids that genetically combine the desired traits in a single plant. Since the pollen grains from the desired plant chosen as the male parent must be gathered and put on the stigma of the flowers chosen as the female parent this is a highly time-consuming and laborious operation. Furthermore, the intended character combinations are not always present in the hybrids; typically, just one in a few hundred to a thousand crossings exhibits the desired combination[3], [4].

(iv) Selection and testing of better recombinants:

In this phase, plants with the appropriate character combination are chosen from the hybrids' offspring. The breeding goal's success depends on the selection process, which necessitates a meticulous, scientific assessment of the offspring. This process results in plants that are better than both of their parents (frequently, there will be more than one superior offspring plant available). To prevent the characteristics from segregating in the offspring, they are self-pollinated for numerous generations until they attain a condition of homogeneity (homozygosity).

(v) The development, introduction, and commercialization of novel cultivars:

The recently chosen lines are assessed for their production as well as other agronomic characteristics like quality, disease resistance, etc. These are raised in research fields, and their performance is evaluated in accordance with the best fertilizer application, irrigation, and crop management techniques. The materials are then tested in farmers' fields for at least three growing seasons at various sites around the nation, representing all the agroclimatic zones where the crop is often cultivated, after being evaluated in research fields. The material is assessed in relation to the top local crop cultivar, often known as a check or reference cultivar.India is mostly a farming nation. Nearly 62 percent of the population is employed in agriculture, which contributes about 33 percent of India's GDP. Producing adequate food for the nation's expanding population was one of the biggest problems India faced after gaining its freedom. India must work to boost yields per unit area from the country's current farmland since there is a limited amount of land suitable for agriculture. As a consequence of diverse plant breeding procedures, numerous high yielding wheat and rice varieties were developed in the middle of the 1960s, which dramatically increased our nation's food output. This period is often known as the Green Revolution[5], [6].

Wheat and rice output grew between 1960 and 2000, from 11 million tonnes to 75 million tonnes for wheat and from 35 million tonnes to 89.5 million tonnes for rice. This resulted from the creation of semi-dwarf wheat and rice types. Semi-dwarf wheat was created by Nobel winner Norman E. Borlaug at the International Centre for Wheat and Maize Improvement in Mexico. The Indian wheat-growing region saw the introduction of numerous high-yielding, disease-resistant cultivars in 1963, including Sonalika and KalyanSona. From Taichung Native-1 (from Taiwan) and IR-8, produced at the International Rice Research Institute (IRRI), the Philippines, semi-dwarf rice types were created. In 1966, the derivatives

were first offered. Later semi-dwarf cultivars Jaya and Ratna with higher yields were created in India.Saccharumbarberi, sometimes known as sugar cane, was first cultivated in north India but had a low sugar content and yield. South Indian canes cultivated in the tropics Despite having bigger stems and more sugar, Saccharumofficinarum did not thrive in north India. The desired traits of high yield, thick stems, high sugar, and the capacity to thrive in the sugar cane regions of north India were effectively combined in these two species to produce sugar cane cultivars. Millets: India has successfully created hybrid varieties of maize, jowar, and bajra. Several high producing types that are tolerant to water stress have been developed via hybrid breeding.

DISCUSSION

Numerous bacterial, viral, and fungal diseases, particularly in tropical climes, have an impact on the production of farmed crop species. Crop losses may often be substantial, reaching 20–30% or even being completely lost. In this case, breeding and creating disease-resistant cultivars improves food output. Additionally, this lessens the need for fungicides and bactericides. The genetic makeup of the host plant affects the resistance of the host plant, which is the capacity to stop the pathogen from producing illness. It is crucial to understand the causal organism and the transmission method prior to breeding. Rusts, such as brown rust of wheat, red rot of sugarcane, and late blight of potato, are some of the illnesses brought on by fungi. Other diseases are brought on by bacteria, such as black rot of crucifers, and viruses, such as tobacco mosaic and turnip mosaic[7], [8].

Breeding strategies for disease resistance: Breeding may be done through mutant breeding or the traditional breeding methods (already discussed). Hybridization and selection are the traditional techniques for breeding for disease resistance. The procedures are substantially the same as for breeding for other agronomic traits like high yield. Screening germplasm for sources of resistance, fusing chosen parents, choosing and assessing the hybrids, and testing and releasing new kinds are some of the sequential stages.The restricted number of disease resistance genes that have been found and recognized in diverse crop types or their wild relatives often places restrictions on conventional breeding. Inducing mutations in plants using a variety of techniques and then testing the plant materials for resistance might sometimes result in the identification of advantageous genes. Then, plants with these desired traits may either be immediately multiplied or employed in breeding. Genetic engineering and selection among soma-clonal variations are two more breeding techniques. A new personality or attribute that is not present in the parental type is formed via the process of mutation, which involves alterations in the basic sequence of DNA. Mutation breeding refers to the technique of choosing and employing plants that have the desired character as a source in breeding and inducing mutations intentionally via the use of chemicals or radiations (like gamma radiations). Mutations in mung beans produced resistance to powdery mildew and the yellow mosaic virus.

It has been shown that certain wild cousins of various cultivated kinds of plants possess specific resistance traits but have a relatively poor yield. Therefore, it is necessary to add the resistant genes to the grown types that provide large yields. Bhindi (Abelmoschusesculentus) developed resistance to the yellow mosaic virus after inheriting it from a wild species, giving rise to the new variety known as Parbhanikranti. In all of the aforementioned instances, sources of resistance genes are found in closely related wild species or in the same crop species that has to be grown for disease resistance. Sexual hybridization between the target and the source plant, followed by selection, results in the transfer of resistance genes.

Plant breeding to develop insect pest resistance

Infestation by insects and other pests is a significant factor in the widespread loss of agricultural plants and crop products. Host crop plants' insect resistance may be brought on by morphological, biochemical, or physiological traits. In numerous plants, hairy leaves are correlated with insect pest resistance, such as resistance to jassids in cotton and cereal leaf beetles in wheat. Solid stems in wheat cause the stem sawfly to not choose it, whereas cotton cultivars with smooth leaves and no nectar do not attract bollworms. Maize's high aspartic acid concentration, low nitrogen level, and low sugar content make it resistant to maize stem borers. The procedures involved in breeding for insect pest resistance are the same as those for breeding for any other agronomic characteristic, such as yield or quality, as was previously stated. Sources of resistance genes might include agricultural germplasm collections, domesticated cultivars, and wild relatives[9], [10].

Plant Improvement for Better Food Quality

More than 840 million people worldwide lack access to enough food to satisfy their daily dietary and nutritional needs. Three billion people, a significantly bigger number, have "hidden hunger" or micronutrient, protein, and vitamin shortages as a result of their inability to purchase adequate fruits, vegetables, legumes, fish, and meat. Diets deficient in critical micronutrients, including iron, vitamin A, iodine, zinc, and iron, raise the risk of illness, shorten life expectancy, and impair cognitive function.The most practical way to enhance public health is via biofortification, which involves growing crops with greater amounts of vitamins, minerals, or higher levels of protein and better fats.

Breeding for better nutritional quality aims to increase: (i) the quantity and quality of protein; (ii) the quantity and quality of oil; (iii) the quantity and quality of vitamins; and (iv) the quantity and quality of micronutrients and minerals.In 2000, researchers created new maize hybrids that had twice as much lysine and tryptophan as those already in use. High protein-content wheat variety Atlas 66 has been utilized as a donor to improve grown wheat. An iron-fortified rice variety with almost five times as much iron as frequently eaten types has been developed.The Indian Agricultural Research Institute in New Delhi has also released a number of vegetable crops that are high in vitamins and minerals, including broad, lablab, French, and garden peas that are protein- and iron-fortified, as well as bitter gourd, bathua, mustard, and tomatoes that are vitamin C-fortified.

Significant Cell Protein (SCP)

At the pace at which the human and animal populations are expanding, conventional agricultural output of grains, pulses, vegetables, fruits, etc., may not be able to supply the need for food. Since it takes 3–10 kg of grain to produce 1 kg of meat via animal rearing, the transition from grain-to-meat diets likewise increases demand for cereals. Can you provide an explanation for this claim in light of your understanding of food chains? More than 25% of people worldwide experience hunger and malnutrition. Single Cell Protein (SCP) is one of the additional sources of protein for both animal and human nutrition.Industrial-scale microbe farming is being done to produce high-quality protein. Spirulina is a kind of microorganism that can be readily cultivated in huge numbers on a variety of substrates, including starch-containing waste water from potato processing factories, straw, molasses, animal dung, and even sewage. It may be used as a source of food that is high in protein, minerals, lipids, carbohydrates, and vitamins. In addition, such use lessens environmental contamination. 200 g of protein are produced each day by a 250 kg cow, according to calculations. Due to the high rate of biomass synthesis and development of a microorganism like Methylophilusmethylotrophus, 250g of it may be predicted to create 25 tonnes of protein

during the same time span. It is conceivable that microorganisms will also be accepted as food given that mushrooms are consumed by a vast number of people and that big-scale mushroom production is a booming business.

Culture of Tissue

Tissue culture is a newer technology that was created since old breeding methods failed to keep up with demand and provide quick enough systems for crop development. Tissue culture: What does it mean? Scientists discovered in the 1950s that whole plants could be produced from explants, or plant parts that were removed and cultivated in a test tube under sterile circumstances in specialized nutritional medium. The ability to develop a whole plant from any cell or explant is referred to as totipotency. In higher level courses, you will discover how to do this. The need for a carbon source, such as sucrose, as well as inorganic salts, vitamins, amino acids, and growth regulators like auxins and cytokinins, among other things, must be emphasized here. By using these techniques, it is feasible to propagate a large number of plants in a short amount of time. Micro-propagation is the term used to describe the process of growing hundreds of plants using tissue culture. Each of these plants will be somaclones, or genetically identical to the parent plant from which they were developed. This technique has been used to generate several significant food plants, including tomato, banana, apple, etc., on a commercial scale. Try taking your instructor to a tissue culture lab to better understand and appreciate the procedure.

The method's recovery of healthy plants from plants with diseases is another significant application. Despite a virus infecting the plant, the meristem (apical and axillary) remains virus-free. Therefore, to get plants devoid of viruses, one might extract the meristem and grow it in vitro. Banana, sugarcane, potato, and other plant meristems have all been successfully cultured by scientists. Even single cells from plants have been separated by scientists, who were able to separate naked protoplasts (enclosed by plasma membranes) after breaking down the cells' cell walls. Hybrid protoplasts, which may then be cultivated to produce a new plant, can be created by fusing isolated protoplasts from two species of plants, each of which has a desired trait. Somatic hybridization is the procedure, and these hybrids are known as somatic hybrids. Imagine a scenario in which a tomato protoplast and a potato protoplast are combined, grown together, and then produce new hybrid plants containing traits from both the tomato and the potato. Well, this was accomplished, resulting in the development of the tomato plant; however, this plant lacked the ideal mix of traits for its intended use in commerce. Five hybrid agricultural plant kinds have been created in India.

CONCLUSION

The foundation of contemporary agriculture is plant breeding for disease resistance, which has significant consequences for food security, environmental sustainability, and the decrease of chemical inputs. This conclusion emphasizes the critical significance of producing disease-resistant plants and their involvement in tackling the intricate problems that confront global agriculture. Selective breeding and genetic engineering are used to create disease-resistant crop types, which is a proactive strategy for reducing the effects of pests and plant diseases. We can lessen the need for chemical pesticides, cut down on production losses, and encourage sustainable farming practices by growing crops that can naturally fend against these dangers. The need for food will increase as the world's population expands, putting more strain on agricultural systems. In order to address this challenge, disease-resistant plant breeding is a crucial tool since it enables farmers to produce more food with less inputs while preserving the environment.

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