

STRESS & BROILER CHICKEN

STRESS (Trauma, Tension or Pressure) are one important factor affecting broiler performance. But unfortunately, broiler farmers are not concerned of the issue. Any situation or factor actually causing a negative impact on the well-being of an animal is called as Stress. Stressed poultry, like stressed people, experience changes in their body chemistry that affect their health, behavior and performance.

By nature the chicken is coward and is scared of any sudden changes. This fear leads to stress which can cause variety of complaints & diseases that would otherwise not affect the birds.

Factors causing stress are called stressor. In poultry, the chicks are subjects to stress since the time of hatch. Undoubtedly, the bird experiences various stressors each day in production. Short-term stress can be expected, and with the exception of situations such as acute heat stress, is typically of minimal concern. However, long-term stress can have far reaching detrimental effects on poultry production.

CLASSIFICATIONS OF STRESS

Stress responses can be categorized as specific or nonspecific.

Specific stressors are typically short-term, such as a sudden increase in environmental temperature.

Animals typically react to specific stressors by trying to combat the stressor.

Long-term or nonspecific stress, however, results in the animal taking measures to adapt the stressor, rather than dealing with it directly.

EFFECT OF LONG TERM STRESS ON CHICKEN:

When a bird first encounters a stressor, the nervous system is activated which leads to marked increases in blood pressure, muscle tone, nerve sensitivity, blood sugar & respiration. Failure to combat the stressor immediately results in the activation of hypothalamus-pituitary-adrenal cortex which leads to release of ACTH from pituitary gland which in terns leads to release of corticosteroids in blood. Excess corticosteroid in blood disturbs glucose & mineral metabolisms, creates cardiovascular problem, intestinal lesions and also severely impairs immune system. There may be regression of bursa, thymus & spleen in chicken resulting immune-suppression.

Predominantly, the effects of long-term physiological stress can be categorized as immunological or metabolic. Physiological stress causes several detrimental effects on broiler performance and carcass quality, most likely due to the effects of glucocorticoids on glucose metabolism. There may be sharp reduction in body weight gain, sometime despite marked increase in feed intake leading to elevated FCR. Stressed broilers also typically display increase in abdominal fat deposition and reduction in muscle accretion.

Considering the fact that stressed broilers prefer to metabolize glucose, increased dietary or supplemental glucose, or inclusion of dietary carbohydrate or amino acids that can be converted to glucose would seem to have potential for stress alleviation. For example, supplementing glucose in the drinking water of broilers subjected to heat stress resulted in increased body weight gain compared with heat-stressed broilers fed no supplemental glucose.

Additionally amino acids like Methionine, Threonine, Arginine, Valine, Isoleucine, Trpytophan, Cystine, Glycine, Serine, Tyrocine, Phenylalanine, Alanine & Histidine are glucogenic and can be converted to glucose.

Hence, providing increased amino acids in the diet could lessen the glucose production burden placed on skeletal muscle during stress, thereby decreasing Corticosteroid driven catabolism. Additionally, physiological stress reduces the protein digestibility of broilers, which could increase the requirements for amino acids during stress. Tryptophan has the potential to alleviate stress.



Pic 1. Heat Stress in Chicks



Pic 2. Heat Stress in Broiler

Heat stress research has demonstrated that increase dietary electrolyte balance have the potential to improve broiler survival during heat stress. Research has demonstrated that supplemental A, D, E, and B-complex vitamins in the drinking water of heat-stressed broilers result in improved performance. In addition, broilers given ascorbic acid (Vit C) supplements during heat stress had improved performance.



Pic 3. Cold Stress (Huddling) in Chicks



Pic 4. Cold Stress (Huddling) in Chicks

There are many stressors in poultry, some of which can be avoidable through proper farm management. Few stressors cannot be avoidable, they need to be overcome.

AVOIDABLE STRESSORS are management related e.g. Overcrowding, Poor Ventilation, Wet Litter, Litter Ammonia, Dehydration, Poor Farm Management, Toxins and Water Deprivation & Feed Starvation etc.

UN-AVOIDABLE STRESSORS are Extreme Climate like Heat, Cold & Humidity, Rapid Growth in Broiler, Diseases, Handling of birds, Vaccination, Medication, Transportation, beak trimming, etc.

Minimizing Stress means maximizing farm performance shall be practiced with respect of overcrowding, poor ventilation, wet litter, litter ammonia, dehydration, poor farm management, feed toxins, water deprivation, feed starvation, poor handling of birds, vaccination, medication, transportation or shifting, beak trimming, etc.

Management of long term stress like Heat Stress, Cold Stress, and Disease shall be dealt through

- 1) Effective Farm Management as per need
- 2) Implementation of 100% Biosecurity and
- 3) Need based Nutrition; there shall be more energy, higher amino acid concentration with additional electrolytes.