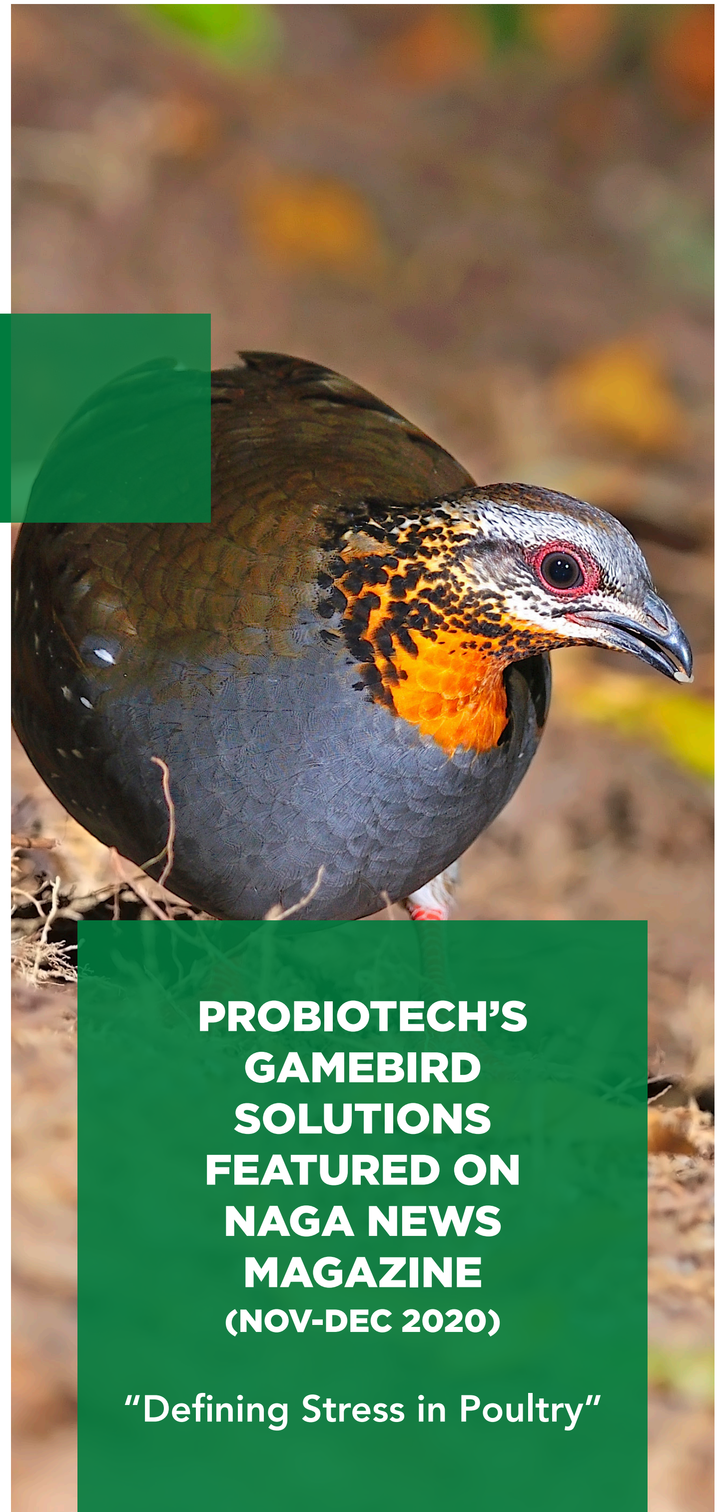
YORK AG

INNOVATIVE DEPENDABLE EFFECTIVE

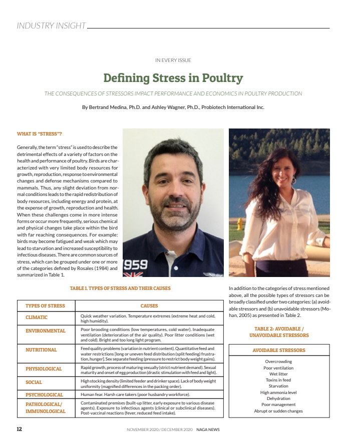


PROBIOTECH INTERNATIONAL

INNOVATION, COUPLED WITH PERFORMANCE, MAKE PROBIOTECH'S PORTFOLIO IDEAL FOR GAMEBIRD APPLICATIONS.

York Ag is an authorized U.S. distributor of innovative gamebird solutions from Probiotech International.

Read an article from Bertrand Medina, Ph.D., and Ashley Wagner, Ph.D., Probiotech International Inc., featured on the NAGA News Magazine (November - December 2020 issue) published by the North American Gamebird Association.



INDUSTRY INSIGHT

IN EVERY ISSUE

Defining Stress in Poultry

THE CONSEQUENCES OF STRESSORS IMPACT PERFORMANCE AND ECONOMICS IN POULTRY PRODUCTION

By Bertrand Medina, Ph.D. and Ashley Wagner, Ph.D., Probiotech International Inc.

WHAT IS "STRESS"?

Generally, the term "stress" is used to describe the detrimental effects of a variety of factors on the health and performance of poultry. Birds are characterized with very limited body resources for growth, reproduction, response to environmental changes and defense mechanisms compared to mammals. Thus, any slight deviation from normal conditions leads to the rapid redistribution of body resources, including energy and protein, at the expense of growth, reproduction and health. When these challenges come in more intense forms or occur more frequently, serious chemical and physical changes take place within the bird with far reaching consequences. For example: birds may become fatigued and weak which may lead to starvation and increased susceptibility to infectious diseases. There are common sources of stress, which can be grouped under one or more of the categories defined by Rosales (1984) and summarized in Table 1.

TABLE 1. TYPES OF STRESS AND THEIR CAUSES

TYPES OF STRESS	CAUSES
CLIMATIC	Quick weather variation. Temperature extremes (extreme heat and cold, high humidity).
ENVIRONMENTAL	Poor brooding conditions (low temperatures, cold water). Inadequate ventilation (deterioration of the air quality). Poor litter conditions (wet and cold). Bright and too long light program.
NUTRITIONAL	Feed quality problems (variation in nutrient content). Quantitative feed and water restrictions [long or uneven feed distribution (split feeding) frustration, hunger]. Sex separate feeding (pressure to restrict body weight gains).
PHYSIOLOGICAL	Rapid growth, process of maturing sexually (strict nutrient demand). Sexual maturity and onset of egg production (drastic stimulation with feed and light).
SOCIAL	High stocking density (limited feeder and drinker space). Lack of body weight uniformity (magnified differences in the packing order).
PSYCHOLOGICAL	Human fear. Harsh care takers (poor husbandry workforce).
PATHOLOGICAL/ IMMUNOLOGICAL	Contaminated premises (built-up litter, early exposure to various disease agents). Exposure to infectious agents (clinical or subclinical diseases). Post-vaccinal reactions (fever, reduced feed intake).

In addition to the categories of stress mentioned above, all the possible types of stressors can be broadly classified under two categories: (a) avoidable stressors and (b) unavoidable stressors (Mohan, 2005) as presented in Table 2.

TABLE 2: AVOIDABLE / UNAVOIDABLE STRESSORS

AVOIDABLE STRESSORS
Overcrowding
Poor ventilation
Wet litter
Toxins in feed
Starvation
High ammonia level
Dehydration
Poor management
Abrupt or sudden changes

12 NOVEMBER 2020 / DECEMBER 2020 NAGA NEWS

PROBIOTECH'S GAMEBIRD SOLUTIONS FEATURED ON NAGA NEWS MAGAZINE (NOV-DEC 2020)

"Defining Stress in Poultry"

YORK AG

INNOVATIVE DEPENDABLE EFFECTIVE

www.yorkag.com/gamebird

York Ag creates holistic ingredient solutions that optimize animal well-being. ALTERNA® POULTRY, ALTERNA® POULTRY OP, ALTERNA® HTS, ALTERNA® HTS OP, SYNBIOTEC® POULTRY, SYNBIOTEC® POULTRY OP, SYNBIOTEC® CVA, PHYTOZEN® 250, PHYTOZEN® OP, PHYTOZEN® LIQUID, and BIOTANIX® WS are registered trademarks of Probiotech International, Inc. NAGA News Magazine is published by the North American Gamebird Association.

York Ag Products, Inc.
1060 ROOSEVELT AVENUE
YORK, PA 17404-2833

Phone (717) 843-9937
(800) 632-1895
Fax (717) 845-7885
Email info@yorkag.com
Web www.yorkag.com

@YorkAgProducts

IN EVERY ISSUE

Defining Stress in Poultry

THE CONSEQUENCES OF STRESSORS IMPACT PERFORMANCE AND ECONOMICS IN POULTRY PRODUCTION

By Bertrand Medina, Ph.D. and Ashley Wagner, Ph.D., Probiotech International Inc.

WHAT IS "STRESS"?

Generally, the term "stress" is used to describe the detrimental effects of a variety of factors on the health and performance of poultry. Birds are characterized with very limited body resources for growth, reproduction, response to environmental changes and defense mechanisms compared to mammals. Thus, any slight deviation from normal conditions leads to the rapid redistribution of body resources, including energy and protein, at the expense of growth, reproduction and health. When these challenges come in more intense forms or occur more frequently, serious chemical and physical changes take place within the bird with far reaching consequences. For example: birds may become fatigued and weak which may lead to starvation and increased susceptibility to infectious diseases. There are common sources of stress, which can be grouped under one or more of the categories defined by Rosales (1984) and summarized in Table 1.

TABLE 1. TYPES OF STRESS AND THEIR CAUSES

TYPES OF STRESS	CAUSES
CLIMATIC	Quick weather variation. Temperature extremes (extreme heat and cold, high humidity).
ENVIRONMENTAL	Poor brooding conditions (low temperatures, cold water). Inadequate ventilation (deterioration of the air quality). Poor litter conditions (wet and cold). Bright and too long light program.
NUTRITIONAL	Feed quality problems (variation in nutrient content). Quantitative feed and water restrictions [long or uneven feed distribution (split feeding) frustration, hunger]. Sex separate feeding (pressure to restrict body weight gains).
PHYSIOLOGICAL	Rapid growth, process of maturing sexually (strict nutrient demand). Sexual maturity and onset of egg production (drastic stimulation with feed and light).
SOCIAL	High stocking density (limited feeder and drinker space). Lack of body weight uniformity (magnified differences in the packing order).
PSYCHOLOGICAL	Human fear. Harsh care takers (poor husbandry workforce).
PATHOLOGICAL/ IMMUNOLOGICAL	Contaminated premises (built-up litter, early exposure to various disease agents). Exposure to infectious agents (clinical or subclinical diseases). Post-vaccinal reactions (fever, reduced feed intake).

In addition to the categories of stress mentioned above, all the possible types of stressors can be broadly classified under two categories: (a) avoidable stressors and (b) unavoidable stressors (Mohan, 2005) as presented in Table 2.

TABLE 2: AVOIDABLE / UNAVOIDABLE STRESSORS

AVOIDABLE STRESSORS
Overcrowding
Poor ventilation
Wet litter
Toxins in feed
Starvation
High ammonia level
Dehydration
Poor management
Abrupt or sudden changes

UNAVOIDABLE STRESSORS
Extreme weather
Handling
Vaccination
Transportation
Rapid growth breed
Debeaking
Lighting
Medication
Hormonal changes

Even if the avoidable stressors can be completely eliminated under efficient management conditions, the load of unavoidable ones at best can only be minimized; and thus, stress factors are inevitable events in poultry husbandry. The consequences of the stressors as previously mentioned impact performance and economics in all poultry production, but in comparison, fowl demonstrate more susceptibility to and greater consequences from these stressors than chickens. Beyond good management practices, what else can be done to alleviate unavoidable stressors?

CAN BOTANICALS ALTER STRESS INDUCED BEHAVIOR?

An experiment was conducted at the National Research Institute in France (1999) to assess the effect of a botanical blend on animal behavior. This botanical blend was based off of plant derived essential oil compounds offered as a feed additive. Three strains of young Japanese quails, aged six to eight days (n=180; 3 x 2 x 30) were characterized by their level of social motivation (their tendency to rejoin and stay close to peers): the high social motivated (S+), the low social motivated (S-) and neutral (ST).

For each type, two groups of 30 birds (control or treated with the botanical blend) were individually tested for their reaction towards a group of peers using a treadmill device. The amount of time the tested subject (separated quail) spends away from a "stimulus" group was recorded.

In the tested group, the air surrounding the bird was enriched by spraying the botanical blend (continuous release).

For the three types of quails, the botanical blend had a positive effect on social motivation: the quails rejoined the stimulus group earlier than in the absence of odorization. Because social motivation is negatively correlated with excitability, a decrease in excitability is synonymous with an adaptation to stress. Therefore, the sensory botanical blend reduced the stress of the young quails when the animal was alone.

Following this experiment, a number of botanical compounds and formula were studied for the anxiolytic properties. From this, the product line PHYTOZEN® was developed to promote calm and positive-oriented behavior(s) and improves performance during stress periods (ex. heat, transport, high density, aggressive behavior, social regrouping etc.). In order to demonstrate the efficacy of PHYTOZEN on the behavior of stressed birds, two recent experiments were conducted:

NOVEL OBJECT TEST (NOT).

Two identical barns with broilers were tested at Day 33. PHYTOZEN® was included in the drinking water from Day 29 to slaughter in one of the barns. An orange traffic cone was placed five times in each barn for two minutes and the number of birds entering the three-feet diameter around the cone was recorded (as shown in Picture 1). Birds treated with PHYTOZEN® showed significantly less fear for the novel object placed in the barn (Table 3).

Above: Picture 1

TABLE 3. EFFECT OF PHYTOZEN® ON THE BEHAVIOUR OF BROILERS FACED WITH A NOVEL OBJECT.

Parameter	Control	PHYTOZEN®
Number of birds entering the 3-feet diameter circle around the orange traffic cone, bird/2 min	0.2[a]	2.0[b]

a,bP<0.05.

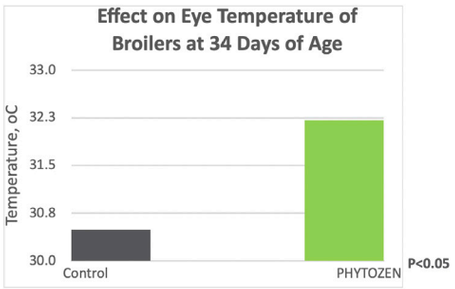
> "IN COMPARISON, FOWL DEMONSTRATE MORE SUSCEPTIBILITY TO AND GREATER CONSEQUENCES FROM THESE STRESSORS THAN CHICKENS"

Opposite, from left to right: Bertrand Medina, Ph.D., Ashley Wagner, Ph.D.

EYE TEMPERATURE TEST UNDER DENSITY STRESS.

The density stress test was conducted in a research facility in Canada using broilers (CRSAD, 2020). The density increased from 7.78 to 9.22 lb/ft2 from Day 30 to Day 34. PHYTOZEN® was supplemented in the drinking water from Day 30 to Day 34. Eye temperature was recorded for each bird. An increase of the eye surface temperature is correlated with a decrease of bird stress (Edgar et al., 2013, Weimer et al., 2020). Density-stressed birds treated with PHYTOZEN® had significantly higher eye temperature compared to the control birds, suggesting that PHYTOZEN® was able to mitigate the negative effect of stress (Graph 1).

GRAPH 1.



There are many different stressors poultry face at various life stages. Although some of these are avoidable with good management practices, there are a number that are unavoidable. The functional feed and water additives (PHYTOZEN®) were developed by Probiotech International Inc. based on brain-effect-selected molecules to enhance good management practices and help mitigate the consequences of unavoidable stressors through an improvement in welfare. Because the consequences of stress are greater in fowl than poultry, PHYTOZEN® may be part of the solution to decrease stress and improve health, welfare and economics of your flock.