

Panbonis® for poultry

Supporting Vitamin D metabolism

Herbonis
Reading Nature

innovad.group









Panbonis® from the plant *Solanum glaucophyllum*



- 100% *Solanum glaucophyllum* based
- Dried and ground *Solanum glaucophyllum* leaves
- Standardized products to guarantee consistent quality
- Complementary feed in the EU
- Full ownership from plant to final product
- > 20 years of classical plant breeding and deep knowledge of *Solanum glaucophyllum* production
- Protected plant variety specifically selected to meet the needs of the industry
- Available for organic production

Panbonis® is a specialty feed ingredient that contains a variety of secondary plant metabolites such as a standardized level of $1,25(OH)_2D_3$ protected by glycosides from the plant *Solanum glaucophyllum* (waxy-leaf nightshade). The bio-active ingredient in Panbonis® interact with the vitamin D receptor in body cells, enabling animals to reach their full genetic potential.

$1,25(OH)_2D_3$ is an essential micronutrient involved in a wide range of physiological processes. It is an integral part of the calcium and phosphorus metabolism resulting in, for example, improved bone mineralization. $1,25(OH)_2D_3$ is in addition connected to fertility, immunity, intestinal integrity, and muscular functions. As vitamin D (as its parent form) alone may not be sufficient in certain phases of production, under challenging conditions or when its activation is compromised, additional dietary supplementation with $1,25(OH)_2D_3$-glycosides supports vitamin D metabolism.

Effects on mineral metabolism

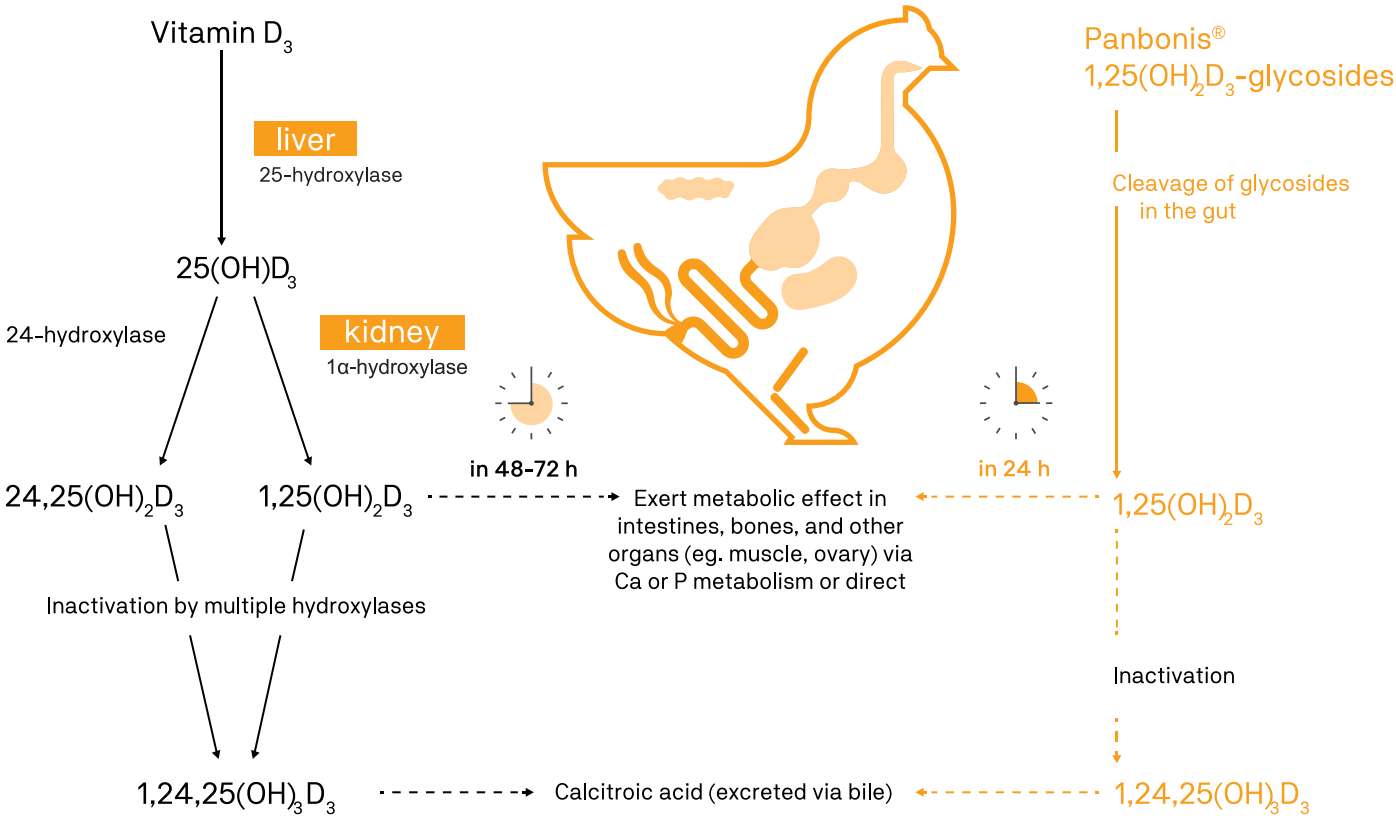
- Supporting Ca and P homeostasis, improving bone strength and muscle contractions (uterus, heart, lungs)

Effects not directly related to mineral metabolism

- Vitamin D receptor (VDR) is present in almost all tissues. Therefore, there is a response to $1,25(OH)_2D_3$ affecting over 200 genes involved in different physiological functions like fertility, immunity, epithelial barrier and muscle functions

Figure 1

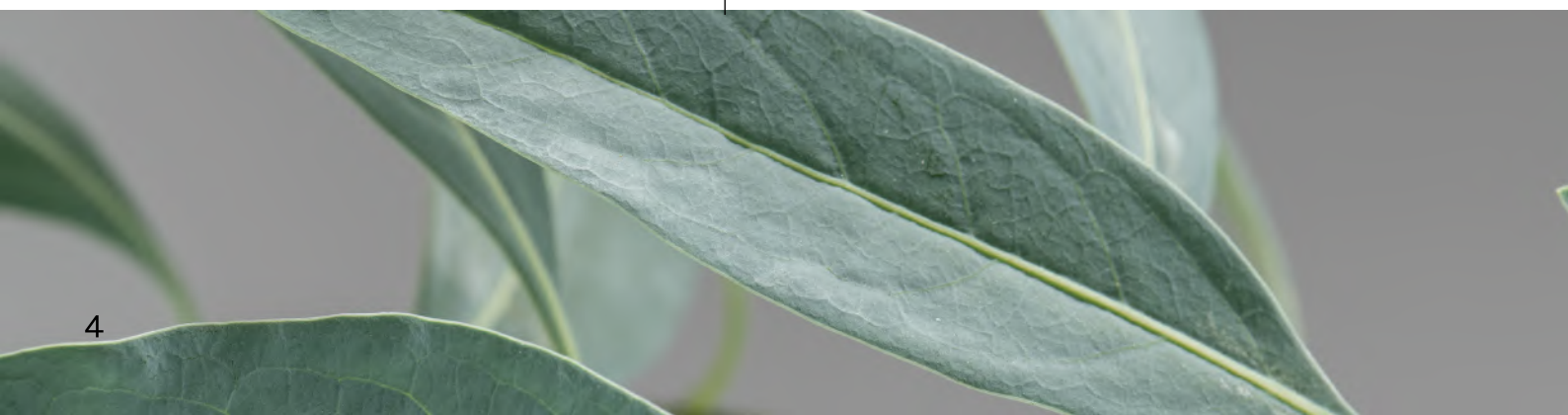
Pathways



- $1,25(OH)_2D_3$- glycosides are a natural metabolite of *Solanum glaucophyllum*
- Glycosides are cleaved by gut enzymes, followed by absorption of the bioactive molecule
- Cleavage is a gradual process that ensures a slow release of $1,25(OH)_2D_3$
- Panbonis® directly supports mineral metabolism in the animal
- Excess of $1,25(OH)_2D_3$ is inactivated and excreted via bile

The synthesis and inactivation of $1,25(OH)_2D_3$ are regulated by feedback mechanisms affecting the activity of 1α-hydroxylase. These mechanisms are controlled by various hormones, $1,25(OH)_2D_3$ itself, and the levels of Ca and P in the blood, to maintain calcium homeostasis.

Because $1,25(OH)_2D_3$ content in blood is regulated by enzymatical inactivation, Panbonis® is safe up to 10x the recommended dose.



Egg producing poultry

Panbonis® is an excellent solution to improve eggshell quality and bone quality reducing osteoporosis and cage layer fatigue.

Reduced shell quality is often related to ineffective vitamin D metabolism and consequently poor calcium absorption.

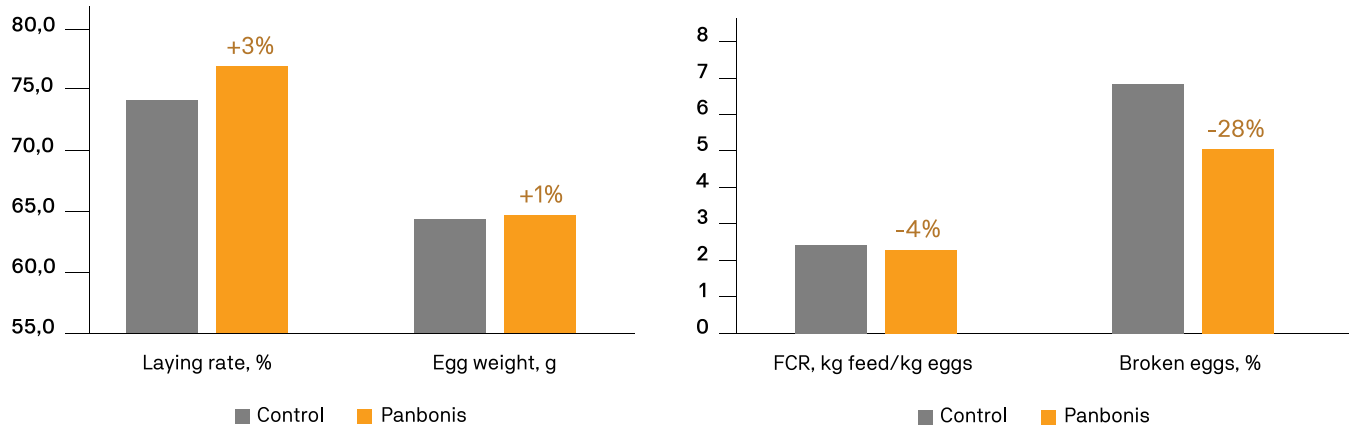
During rearing, Panbonis® stimulates skeletal calcification, bone strength and development of reproductive organs, preparing the bird for egg production.

During egg production, Panbonis® shows marked improvements in laying performance and reduces second grade and broken eggs while maintaining skeletal integrity.

More saleable eggs and better performance



At different ages after peak production, Panbonis® increases the laying rate and decreases the number of broken eggs resulting in more saleable eggs.



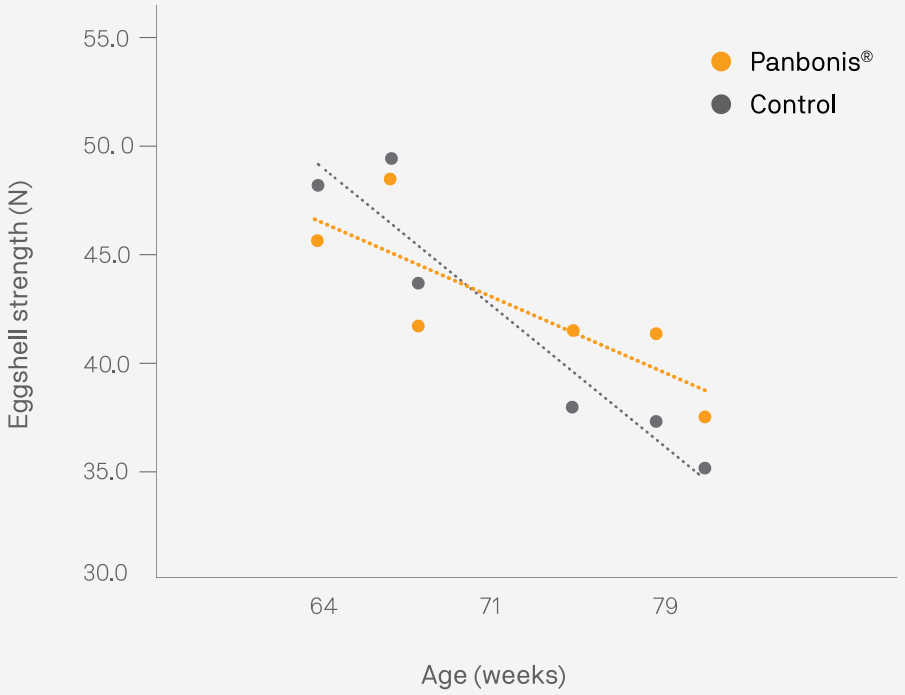
Control group contains vitamin D with/without 25(OH)D_3 in standard commercial diets. Panbonis® is added on top of the control diets.

Average values of 4 to 8 trials (depending on response parameter)

Better eggshell quality

Field trial,
The Netherlands

Panbonis® delays the reduction of the eggshell quality.



Hen age: 62-80 weeks

UNESP, Brazil (Santos et al., 2024)

External shell quality	Control	Panbonis®
Eggshell weight, g	5.48[a]	6.06[b]
Eggshell strength, N	24.8[a]	36.7[b]
Eggshell thickness, mm	0.34[a]	0.36[b]
Eggshell density, mg/cm^2	71.4[a]	79.3[b]

a,b indicates significant differences ($P < 0.05$)

Hen age: 110-120 weeks

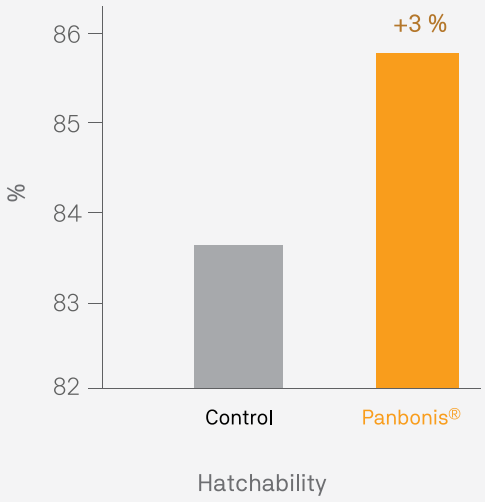
Age effect

Panbonis® effects become more pronounced with age. This is related to the reduced enzymatic activation of vitamin D in the kidneys when birds grow older. Supplementation with Panbonis® compensates for this gap stimulating intestinal calcium absorption, less calcium needs to be mobilized from the bones to maintain eggshell quality.

Improved hatchability and day-old chick weight

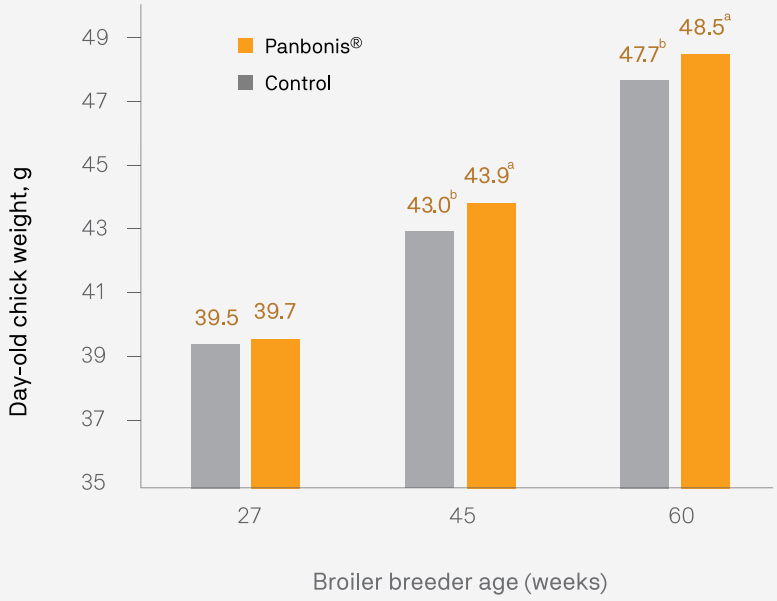
In breeders, Panbonis® improves fertility and hatchability, increases the number of chicks per hen housed and day-old chick weight.

Field trial, UK

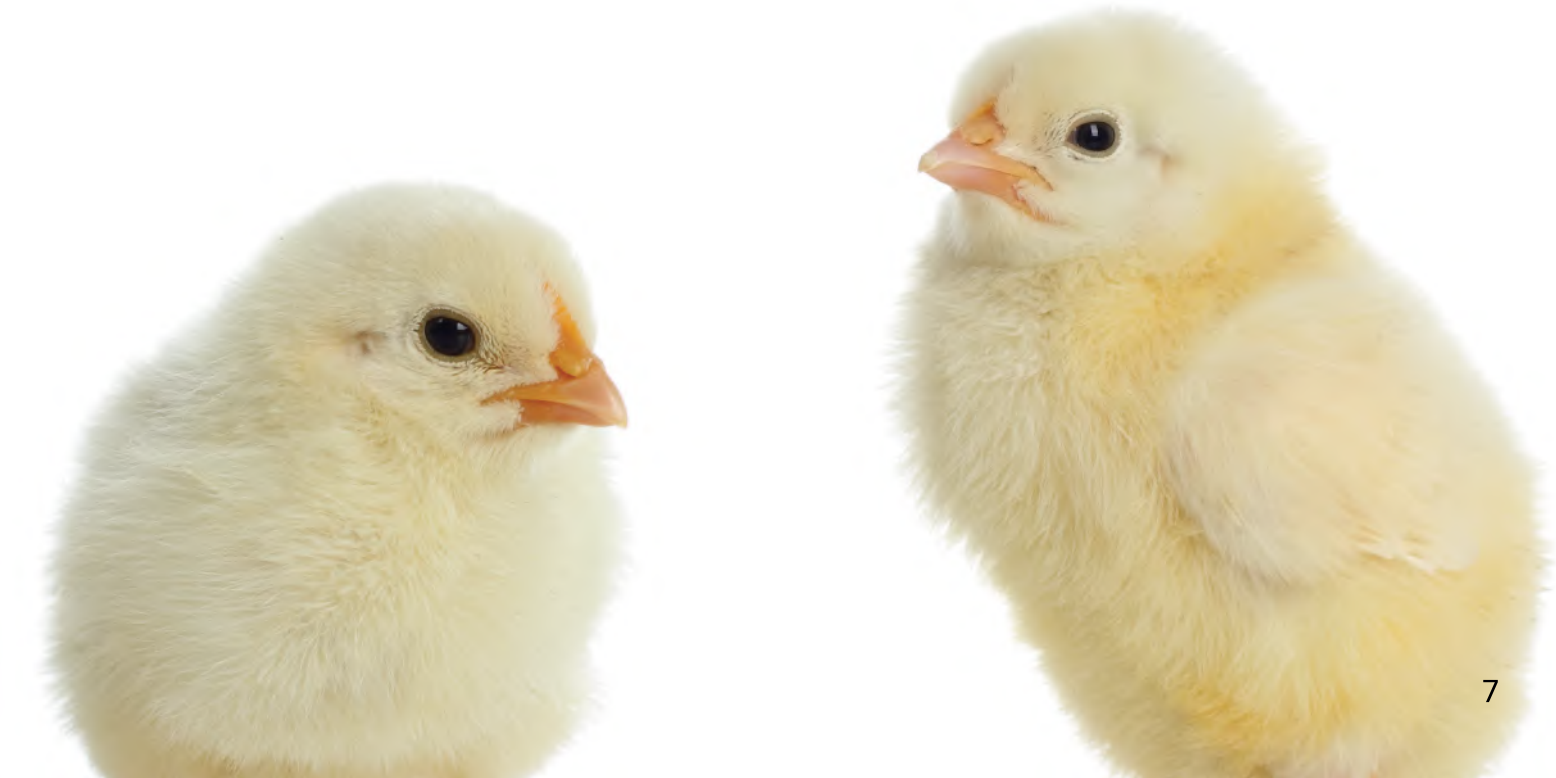


Breeder age: 50-60 weeks

UNIOESTE Brazil, (Nunes et al., 2022)



a,b indicates significant differences (P<0.05)



Meat producing poultry

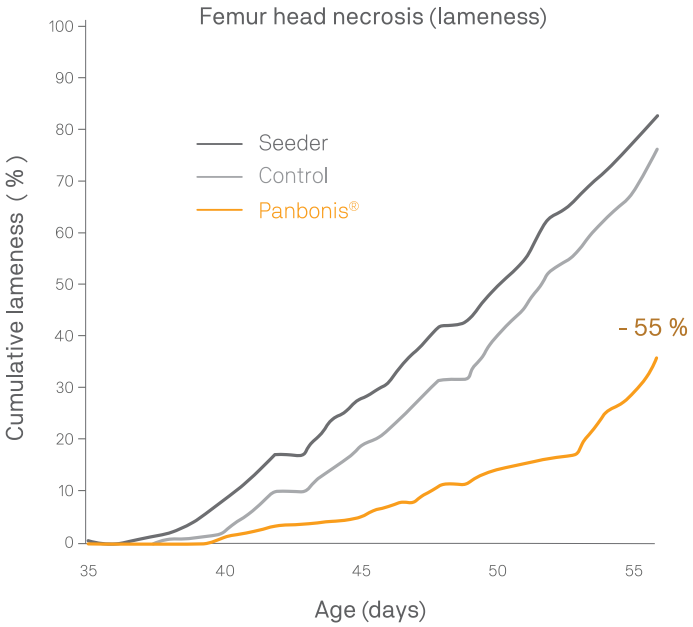
Better bone health

Bone related diseases are often the reason for poor performance, increased mortality, hock burns and breast blisters. They can be caused by insufficient skeletal mineralization (tibial dyschondroplasia, rickets) or by bacterial infections (such as femur head necrosis and joint inflammations).

A significant reduction of femur head necrosis and tibial dyschondroplasia incidence in broilers is observed with the supplementation of Panbonis®.

Femur head necrosis is known to be caused by bacterial translocation to the bones. Research indicates that the respiratory and intestinal epithelial barriers as well as the immune competence are reinforced with Panbonis®.

University Arkansa, USA (Alrubaye et al., 2023)



Institute trial, UK

Tibial dyschondroplasia

	Control	Panbonis®
Tibia breaking strength, N	44.8[a]	49.4[b]
Tibial Dyschondroplasia, %	6.7	0.0[b]

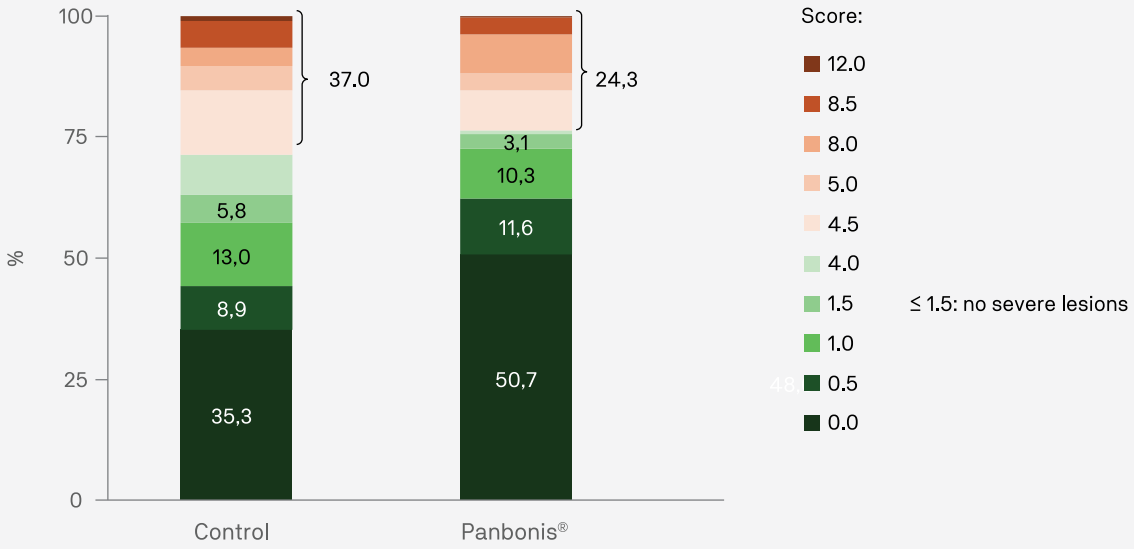
a,b indicates significant differences (P<0.05)

14-day-old broilers

Less breast myopathies

$1,25(OH)_2D_3$ plays an important role in muscle function, development and repair. Breast myopathies are a consequence of impaired muscle fiber growth with low cellular vascularization and respiration. Consequently, oxidative stress and inflammation occur.

Heavy broilers, final body weight ~ 3.2 kg



Panbonis® reduced breast myopathies of heavy broilers, possibly being associated to a better vascularization of the muscle and mitochondrial function. This has a significant impact on reduction of meat downgrades at the processing plant.



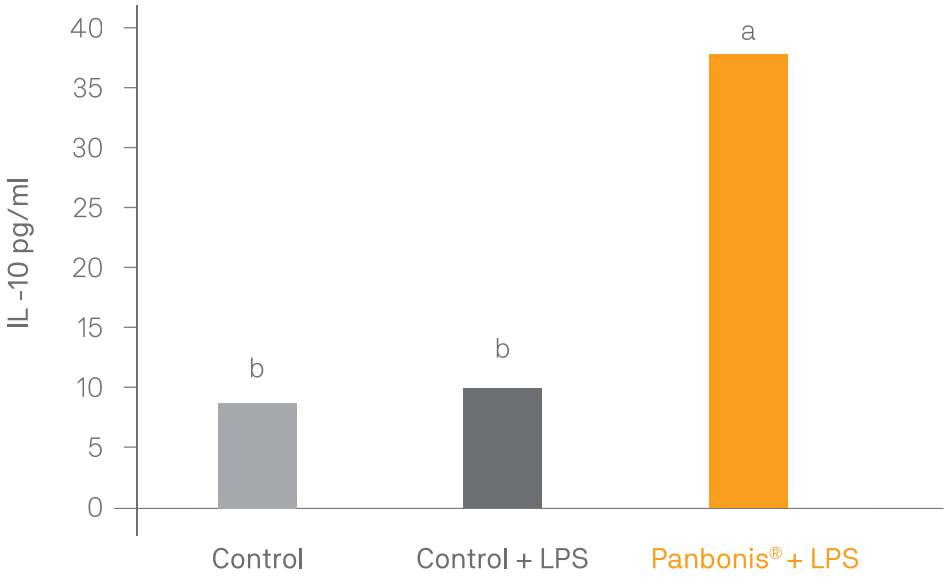
Stronger immunity

LPS administration at 20 days old chickens

	Control	Control + LPS	Panbonis® + LPS	Difference
BWG, g/bird	415[a]	377[b]	413[a]	+ 36 g
FI, g/bird	566	549	561	+ 12 g
FCR	1.36	1.45	1.36	- 9 points

a,b indicates significant differences (P<0.05)

IL-10 is an important anti-inflammatory cytokine crucial for developing immune defenses.



a,b indicates significant differences (P<0.05)

With Panbonis®, birds can better cope with the normal bacterial and viral challenges commonly present on farm.



Benefits of using Panbonis®

LAYING HENS



- Higher laying rate and persistency
- Better eggshell quality reduces downgraded eggs
- More saleable eggs
- Less bone pathologies

BREEDER HENS



- Better fertility
- Better eggshell, laying rate and persistency
- Increases hatchability
- Lower embryo mortality
- Improves day-old chick weight

BROILERS



- Improves performance
- Reduces locomotion problems and bone related diseases
- Supports the immune response
- Increases anti-inflammatory responses (eg. coccidiosis)

Dosage and recommendation

For all poultry species 100 g/MT of Panbonis® 10 or 50 g/MT of Panbonis® 20 recommended on top of normal vitamin D levels.
Panbonis® 1 (1000 g/MT) and Panbonis® 2 (500 g/MT) are also available.

For more information please visit herbonis.com

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