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CIBENZA® DP100

Improving Protein Digestibility of Poultry Diets

Poultry producers know feed is the most important and costly input in their operation. In fact, feed accounts for up to 70% of their total production cost. 'Tweaking' formulations can only save so much, with escalating feed costs broiler and layer producers need a solution for dramatic feed costs savings that won't compromise their bird performance, when feed costs escalate.

Recently, Novus International, Inc., introduced CIBENZA® DP100 feed additive – a particularly aggressive, heat-stable, broad spectrum single protease activity that complements the animal's endogenous enzymes to hydrolyze less digestible proteins in animal and plant materials into their constituent components – peptides and amino acids - that are directly absorbed by the gut. Protease enzymes naturally occur in the digestive tracts of all animals, including poultry, however, these endogenous enzymes are not as effective as exogenous proteases in breaking down certain protein sources. This is particularly true in younger birds compared to older birds.

The use of enzymes in poultry rations is not new. In fact they have become a widely accepted and increasingly popular element of many poultry diets. Previously, though, most enzymes focused on optimizing energy or phosphorous components of feed rations. CIBENZA® DP100 is different in that it allows producers to optimize the protein component of poultry diets. The protease in CIBENZA® DP100 will work on all animal and plant protein components within common feed ingredients.

There is a general misconception that the protein digestibility in feed ingredients is high enough, particularly for soybean meal. While it is true that soy protein is high digestible (typically 85 - 90% amino acid digestibility), this means that approximately 10 - 15% is not available, representing a significant opportunity to improve amino acid utilization by supplementing animal diets with proteolytic enzymes. Formulating using protease enzymes offers the flexibility to allow the use of a wider variety of more cost-effective proteins while maintaining performance levels associated with more expensive feed ingredients, regardless of whether you formulate on a crude protein basis or on a digestible amino acid basis. Besides the cost savings benefits protease enzymes also reduce nitrogen levels in the manure as a result of lower protein diets and better amino acid digestibility despite lower protein levels. This allows the poultry industry to accomplish more with less and meet the need for sustainable production and manage consumer expectations for environmentally compatible practices.

Reduce Protein Not Affecting Performance: Research and extensive commercial experience has shown that CIBENZA® DP100 allows producers to use diets formulated with proteins and amino acids that are 5 to 10% lower than recommended industry standards with no sacrifice in performance for broilers or layers, providing considerable cost savings.

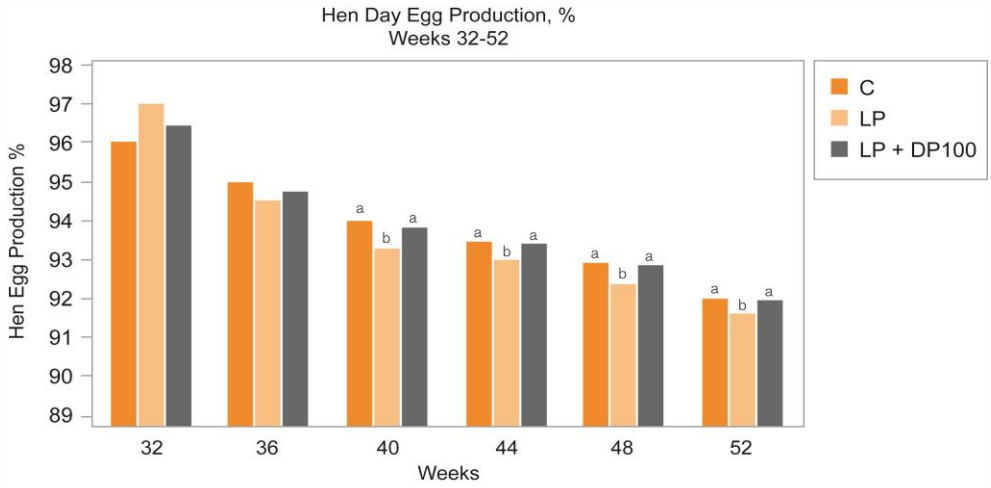
In a recent commercial trial (50,000 birds/facility), the effect of CIBENZA® DP100 on low protein diets was investigated. In this study dietary amino acids were reduced by 7.5% and whole house performance was compared to houses fed with the standard commercial program (0 – 45 days). Table 1 shows that broiler diets supplemented with CIBENZA® DP 100 reduce feed costs without compromising performance. Even when performance was compared between facilities with similar performance indexes (250 – 259, and 290 – 299), CIBENZA® DP100 still resulted in a cost saving of $0.04 (RM0.128) kg/bird.

Table 1. Commercial Broiler Trial - Comparison of all Farms

Farm	No. of Facilities	Average Bodyweight Gain (g/day)	Average Adj. FCR	Average Efficiency Index	Average Cost ($US kg/bird)
Control	260	54.84	1.88	267	$0.83
CIBENZA DP100	3	56.88	1.86	281	$0.79
CIBENZA DP100 Cost Saving				$0.04 (RM0.128)	

A layer trial at North Carolina State University (4,032 hens 32 – 52 weeks of age) showed that adding CIBENZA® DP100 to lower protein diets (10% lower than control diets) bought egg production (Figure 1) and egg mass (data not shown) back to normal protein diet levels

Figure 1. Hen Day Egg Production % Weeks 32 - 52



Bars with the same age group with different superscripts reflect means that are statistically different (P <0.05)
Period 1 (32 – 44 weeks): Control 22% CP, low protein 20% CP
Period 2 (44 – 48 weeks): Control 21% CP , low protein 19% CP
Period 3 (48 – 52 weeks): Control 20% CP , low protein 18% CP

Summary

Protease enzymes are valuable tools to dramatically reduce feed costs and also allow the utilization of non-conventional protein ingredients. CIBENZA® DP100 can replace up to 10% of the crude protein or amino acids in feed and at least achieve the same results. Additionally, protease supplementation can improve gut health and due to the increased amino acid digestibility, the animal's requirement can be met more responsibly at lower protein levels, resulting in reduced nitrogen excretion into the environment.

Replacing Antibiotics in Broiler Chicken Feeding Under the Hot and Humid Tropical Conditions

Prof. Dr. Zulkifli Idrus, Universiti Putra Malaysia & Marie-Laurence LE RAY, Neovia, France

Introduction

Antibiotics used as growth promoters are widely practised in Asia and also in other parts of the world like North and Latin America. But their use is more and more controversial due to the development of antibiotic resistance, both in animal and human health.

Some countries such as Europe or Korea have forbidden the use of antibiotics as growth promoters for several years now and alternatives have been found to replace them efficiently from zootechnical and economic points of view.

The aim of the trial described below was to evaluate the efficacy of an innovative product made of activated copper (B-SAFE) on broilers performances compared to zinc-bacitracin. The trial was conducted in 2012 at University Putra Malaysia to test the product in South-Eastern Asia conditions. Indeed, hot, wet, tropical weather is specific to this area and it is interesting to get a local reference in partnership with a university.

Material and methods

A total of 1680 day-old Cobb 500 male broiler chicks were raised from day 1 to day 42 in a conventional open-sided house (Figure 1).

They were randomly allocated to 24 floor pens of 70 broilers each. The floor space per broiler was 0.077m². They received four different diets in mash form to meet or exceed requirements for Cobb broilers of this age, as follow (Table 1):

Table 1

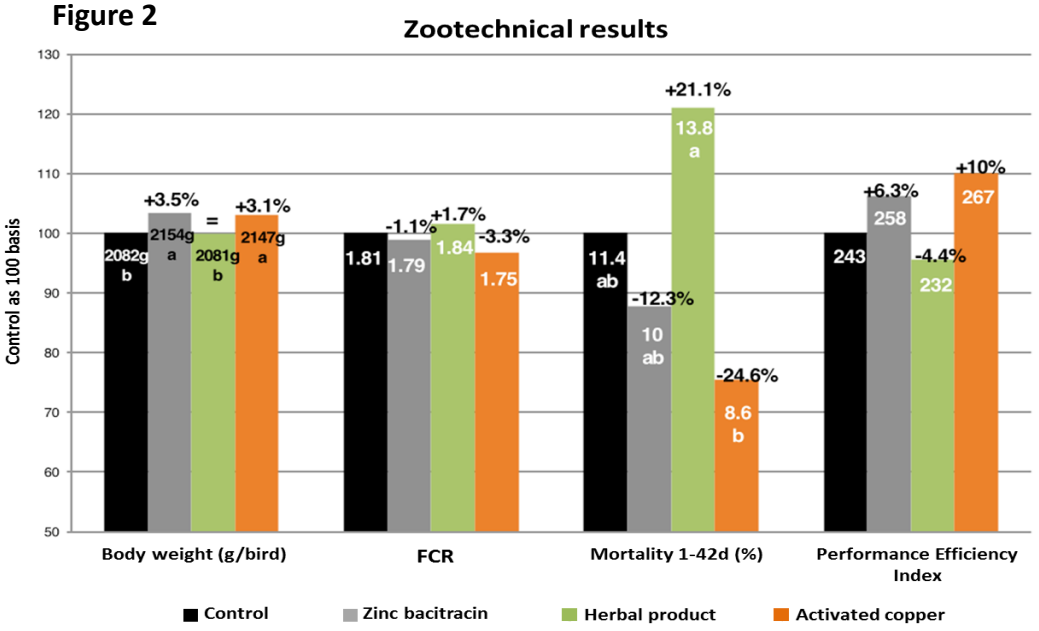
	Starter (1-20 days)	Finisher (20-42 days)
A – Negative control	A – Standard broiler feed	
B – Positive control	A + Zn Bacitracin 25 ppm	
C – Competitor	A + Plant extracts 150 ppm	
D – B-SAFE	A + 200 ppm Activated copper	A + 100 ppm Activated copper

Zootechnical parameters were measured and also incidence of foot pad dermatitis on day 42 (scale from 0 to 2).

Figure 1

Results

Figure 2



Body weight and mortality were significantly improved by the activated copper based product and by zinc-bacitracin, compared to negative control. Feed conversion ratio tended to decrease with the activated copper due to heavier weight and to stability in feed intake.

Thus, Performance Efficiency Index (combination between ADG/FCR and mortality) was improved by 10% compared to negative control and the best was noted for activated copper compared to other tested diets. In this trial, the plant extracts did not improve performance.

Concerning foot pad dermatitis, zinc-bacitracin was the only diet that significantly reduced incidence of foot pad dermatitis (Table 3). However, the score was quite high (scale from 0 to 2) in all cases.

Table 3

Diet	Negative control	Zinc-bacitracin	Plant extracts	Activated copper
Foot pad scoring	1.43a	1.28b	1.52a	1.49a

Conclusion

Under tropical conditions of South-Eastern Asia, a solution made of activated copper was able to replace efficiently zinc-bacitracin as a growth promoter. Zootechnical results are as good as those obtained with the antibiotic and survivability tends to be improved with this natural non medicated and sustainable solution. On the other hand, in this trial, the activated copper was not able to lower the incidence of foot pad dermatitis.

Copper is well-known for its anti-microbial and growth promoting properties and is used at high dosage in some countries. In this trial, the tested solution is not only “simple” copper, it also consisted of a copper linked to specific aluminosilicate clay. The localisation of the copper on the clay strengthen the anti-microbial action of the copper (higher surface contact and interaction with the pathogens) and allows a very low dosage. This is beneficial in terms of minimising the possible side-effect of copper (example crossed resistance, and pollution). This innovative solution was validated under Asian conditions and will help producers to safely reduce or stop using antibiotics as growth promoters in broiler chicken production.

Keeping Gut Bacterial Diseases At Bay

Dr.Suraj. S, M.V.Sc.,
Zeus Biotech Limited, India

What is the way forward?

The gut is believed to have over 200 to 400 species of bacteria. Majority of the bacteria inhabiting the gut are useful to the host as they protect the host from pathogens, break down complex feed substance (aid digestion), produce vitamins and other growth factors that help growth of the host, including the gut immune system. Modern extensive system of management, however, requires strong insurance against diseases, especially for the gut. Considering the risk of regular use of antibiotics as growth promoters, there is a need for an alternative. The concept of using the good bacteria to protect against pathogens has been long thought of. Lactic acid producing bacteria found place in our diets centuries ago and it has been used in modern poultry and piggery industry as well.

Barriers at gut

The gut, which is constantly exposed to pathogens and toxins is a vital area for defense. The intestinal epithelial surface which is selectively permeable forms the physical barrier. Normal flora of the gut produces chemical shields, including mucin, pH, other bacteriostatic and bactericidal substances. Besides the microbial barrier, the secretary antibodies, the T cells, dendritic cells, local lymphoid collections mesenteric lymph nodes all form the immunological barrier.

Gut homeostasis

Gut maintains a balance between the normal, secondary and the opportunistic flora usually. The strong acidic pH of the stomach destroys most of the pathogens that enter through feed. This is followed by bile and pancreatic enzymes. The upper part of the GI tract is not rich with too many diverse flora. However, lower down the intestinal tract microbial flora are found in abundance. It is here they work to produce vitamins, enzymes, and other factors helpful in digestion, and also keep the pathogens under control. The progressive motility of the gut helps to push out the digesta, and also preventing the pathogens from invading the upper part of the intestine.

Disturbances in the gut

The most common disturbance in the gut may occur when there is an imbalance of the gut flora, when the residual or harmful flora, dominate over the normal flora.

Digestive disturbances caused by excessive intake of indigestible substances like non starch polysaccharides, improper secretion of digestive juices, presence of toxins (including mycotoxins) all may lead to blotting of the intestine, poor motility and poor absorption which may give an opportunity for the fast multiplying pathogens to establish itself leading to disease.

Stresses, nutrient deficiency, excessive intake of rapidly digestible substances, along with viral infections are also other common reasons for gut disorders.

What would be the safest way to prevent gut disorders?

1. Management strategies: Ensures clean production system and biosecurity measures. Conduct periodic microbial audit in the farm to investigate the effectiveness of the biosecurity measures. Welfare management and measures to prevent overstress of the animal could help to maintain good gut health.

2. Nutritive strategies: This need to be supported by safe and well balanced digestible feed, which meets the nutrient requirements. The industry also is now using nutritional supplements, prebiotics, acidifiers and lactic acid bacteria are a very commonly used flora. However, most of the vegetative forms of bacteria may not survive the harsh conditions of the stomach and bile of the intestine. The present impetus is therefore on the use of **spore forming** naturally occurring organisms. Bacillus species are the best choice at present as they not just prevent the pathogens by virtue of their antipathogen activity (bacteriostatic and bactericidal substances like BLIS, Subtilins etc.) but also because of their ability to promote growth of normal gut flora especially the lactic acid producing bacteria.

Critical periods for gut disorders

Early age is a very susceptible age especially days 3-7 in poultry and weaning period in piglets. Besides, periods of stress, like vaccination, climatic changes are critical stages where gut disorders may set in.

Therefore, a combination of management and nutritive strategies including the use of a combination of spore forming direct fed microbials like *MICROGUARD™*, prebiotics, acidifiers, and gut motility enhancers shall be an effective and feasible solution.

A Trial conducted by Dr. Maxmillan Anderson at Larrybeth Farm located at Pililia, Rizal, Philippines

Dosage: - 20 g per 1,000 birds from day 1 to day 5
- 10 g per 1,000 birds from day 6 to day 35

PARAMETERS	MICROGUARD™	CONTROL
Population	7,135 head	7,135 head
Mortality	440 head	502 head
% Mortality	6.17 %	7.04 %
Feed consumption	23,250 kg	22,900 kg
Harvest	6,695 head	6,633 head
Total weight harvested	13,090.25 kg	12,593.05 kg
ALW	1.96 kg	1.90 kg
FCR	1.776	1.818
Cost of feeds per kg (Peso)	22.00 per kg	22.00 per kg
Feed cost/kg live (Peso)	39.07 per kg	40.00 per kg
Feed cost per bird (Peso)	76.58 per bird	76.00 per bird
Chick cost (Peso)	22.00 per bird	22.00 per bird
Price/kg live (Peso)	74.00 per kg	74.00 per kg
Gross sales/bird (Peso)	145.04 per bird	140.60 per bird
Input cost (Feed cost + chick cost) (Peso)	98.58 per bird	98.00 per bird
Gross profit per bird (Peso)	46.46 per bird	42.60 per bird
GROSS INCOME FROM MICROGUARD (Peso)	3.86 per bird (RM0.27)	

Note: 1 Philippine Peso = RM0.07

BioAktiv – An Effective, Safe and Profitable Alternative

Although the brand name 'BioAktiv' is relatively new in Asia, BioAktiv products from Germany have been widely used in Europe and Australia for more than a decade. Unlike most other animal health and growth enhancing products, BioAktiv products function based on a German traditional therapeutic method using 'natural oxygen activation'. Through natural oxygen activation, BioAktiv products are able to effectively catalyse various aerobic microbial progresses especially those involved in animal digestion, plant nutrient absorption, and biodegradation of animal and plant wastes. Therefore, BioAktiv products provide an effective alternative method in the applications of animal and plant health and growth enhancement, manure processing, compost production, and wastewater bioremediation. Over the years, BioAktiv products have spread its presence from Europe to Australia, Africa and Asia.

BioAktiv Animal Products

BioAktiv products for animal health and growth enhancement come in the forms of feed additive and drinking water additive. The feed additive for pig, cattle/cow, goat/sheep, horse and other mammals is *BioAktiv for Animal Feed*, and the drinking water additive is *BioAktiv Salis*. The feed and drinking water additives for chicken (broiler and layer), duck, goose and other fowls are *BioAktiv for Animal Feed-G* and *BioAktiv Salis-G,* respectively. Other BioAktiv animal-use products are *BioAktiv for Liquid Manure* for manure processing and *BioAktiv for Animal Feed-S*, a disease-prevention product for pigs.

How BioAktiv Works

BioAktiv GmbH, Germany uses a proprietary manufacturing process to produce BioAktiv products. Through a high-energy accumulator, the manufacture loads a special 'oxygen information' into the raw material of the product to be produced. The raw material of BioAktiv feed additives, both BioAktiv for Animal Feed and BioAktiv for Animal Feed-G, is pure natural chalk (calcium carbonate $CaCO_3$) and the raw material of BioAktiv drinking water additives, both BioAktiv Salis and BioAktiv Salis-G, is pure natural

common salt (sodium chloride NaCl). When a BioAktiv additive product is ingested by an animal, the 'oxygen information' in the product catalyses the aerobic microbial digestion process and enhances nutrient absorption. The resulting more complete absorption of nutrients naturally leads to faster growth and better overall health of the animal.

Higher Profitability

Better absorption of nutrients made possible by BioAktiv products means less wastage of feed and hence an improved FCR (feed conversion ratio) and lower feed cost. It also results in higher ADG (average daily gain) which translates either into heavier animal at sales or faster animal growth and faster to market and hence saving costs and time. Better nutrient absorption also manifests itself as better animal health, and hence reducing mortality rate and medical expenses. Therefore, the overall result of using BioAktiv products is increased profitability for the farmer.

Better Environment

Better fed animals are more satisfied and less aggressive in fighting for food. Therefore, animals fed with BioAktiv products are less noisy and fight less. There are less injuries and the animals are easier to manage. BioAktiv products ensure more complete digestion of feed. There is a negligible amount of nutrients left in manure for bacteria to consume and produce harmful odorous gases. This makes the farm environment more pleasant for both the animals and workers.

Scientifically Proven

The effectiveness of BioAktiv products has been proven in many studies in countries all over the world. The most comprehensive and representative study on pig was commissioned by the Australasia Pig Institute and carried out by the University of Queensland, Australia. A test group and control group each with 10 sows were selected for the study. The study continued with the offspring of both groups of sows (coincidentally 104 piglets in each group) until they reached finisher phase. Various notable findings of the study are given here:

- **Sows** fed with BioAktiv ate 16% more, with better condition score at weaning, lost 18% less weight over lactation, and were quieter and more content.
- **Sucker pigs** (10-23 days) from sows on BioAktiv were found to have 6% higher ADG and 4 times less incidences of scour.
- **Weaner pigs** (24-56 days) on BioAktiv had a 3-time lower mortality and FCR improved by 7%. While none of the BioAktiv pig was treated for post-weaning scours, 15% of control pigs were treated with antibiotics.
- **Grower-finisher pigs** (57-140 days) on BioAktiv have a 10% lower FCR and a 2% higher ADG. While one BioAktiv pig was removed due to injuries (not ill-health), four control pigs were removed due to ill-health.
- **Cost comparison:** BioAktiv provided savings of AUD 2.00 and AUD 5.45 on medical expenses and feed cost respectively and a total savings of AUD 7.45 (RM 21.90) per pig.

Highly Cost-effective

BioAktiv products work by stimulating micro-organisms in a prebiotic nature. Only a small amount the product is needed to accelerate microbial activities, therefore, BioAktiv products are highly cost-effective. The recommended dosages of BioAktiv products are as follows.

BioAktiv for Animal Feed and BioAktiv Salis

Species	BioAktiv for Animal Feed	BioAktiv Salis
Pig	200 g/tonne of feed	1 kg/15,000 litres of water Wet feeding: 200g/tonne of dry feed
Cattle/cow	1-2 g/animal/day	1-2 g/animal/day
Horse	1 g/animal/day	1 g/animal/day
Sheep/goat	0.5 g/animal/day	0.5 g/animal/day

BioAktiv for Animal Feed-G

Mix 200 g per tonne of finished feed

BioAktiv Salis-G

Dissolve 1 kg in 10,000 litres of drinking water for applying through a dosing pump system
Mix 200 g per tonne of dry finished feed for wet feeding (including acidic range).

Naturally Safe

The raw materials used in producing BioAktiv products are all naturally sourced materials which are chalk, common salt and bitter salt ($MgSO_4$ for *BioAktiv for Plants*). These materials are totally harmless to animals, plants, humans and the environment. BioAktiv products derive its health-enhancing effects from a German traditional therapeutic method using 'natural oxygen activation'. The products do not contain any active chemical nor biological agent. The energy which 'oxygen information' possesses is negligible and it works by induction rather than contact to stimulate a microbial sub-ecosystem that is conducive for the necessary microbial processes. In addition, the dosage necessary for a BioAktiv product to work is extremely low (only 200 ppm for pigs) and therefore exceptionally safe.

Quality certifications: BioAktiv animal-use products have been certified by QS for feed production, GMP+ for production and selling processes, and Agreco for input material in organic farming.

Conclusion

Today, BioAktiv is a trusted brand to numerous feed millers and farmers worldwide, especially in Europe, where profit-conscious feed millers and farmers are also particularly discerning about product quality. BioAktiv products have proven to be an effective, save and profitable alternations to the end users.

J.N.Jorenku

Staldren®- The Effective Dry Disinfectant Product

Staldren®, a Danish hygiene product which is environmental friendly and effective on common bacteria and fungi spores (supplementary table). It is phosphate free and pH-neutral, does not dissolve/or loosen floors or pens, nor does it dry out an animal's thin skin, which can be susceptible to abrasions and cuts that consequently leads to bacterial infection and disease.

No gloves are needed when working with Staldren®. It binds the ammonia to such an extent that, both humans and animals can work without the strong smell and breathing difficulties. Staldren® absorbs damp and moisture, and is therefore particularly useful in pens with high humidity. It also disinfects and cleans the farm building environment, reduces the level of infection and, therefore, ensures healthier animals. Staldren® can be used for all domestic animals and is not harmful to either humans or animals.

Bacteria	Staldren®		Control without Staldren®	
	1 hour	2 days	1 hour	2 days
E.coli 0157	<10 CFU/ml	<10 CFU/ml	140 mio CFU/ml	>200 mio CFU/ml
Aspergillus niger ATCC 16406	<100 CFU/ml	<100 CFU/ml	150.000 CFU/ml	500.00 CFU/ml
Clostridium perfringens ATCC 13124	<100 CFU/ml	<10 CFU/ml	20 mio CFU/ml	1,9 mio CFU/ml
Streptococcus uberis ATCC 9927	<10 CFU/ml	<10 CFU/ml	43 mio CFU/ml	1,9 mio CFU/ml
Salmonella typhimurium ATCC 25241	<10 CFU/ml	<10 CFU/ml	>10 mia CFU/ml	>1 mia CFU/ml
Staphylococcus aureus ATCC 25923	<10 CFU/ml	<10 CFU/ml	100 mio CFU/ml	1,2 mia CFU/ml
Streptococcus suis serovar nr. 7	<10 CFU/ml	10 CFU/ml	1500 CFU/ml	6 mio CFU/ml
Campylobacter jejuni ATCC 29428	<10 CFU/ml	<10 CFU/ml	6 mio CFU/ml	>10 mio CFU/ml
Klebsiella Pneumoniae	40 CFU/ml	40 CFU/ml	4,2 mio CFU/ml	36 mio CFU/ml

Pigs

Farrowing: Before farrowing spread Staldren® over the whole farrowing area. Use a good handful (50-100 g) per m². After farrowing, use Staldren® for 3 consecutive days, then twice a week until weaning. Concentrate the application of Staldren® behind the sow and around the laying area (for piglets and sow), as well as any other damp areas as this is where the bacteria will thrive.

Weaning: Use Staldren® for 3 consecutive days, then twice a week. Be sure to cover the resting area, as well as the damp areas within the pens.

Finishing: Use Staldren® once or twice a week. This provides a better environment and has a significant effect on reducing the level of infection.

Breeding: For breeding sows and boars spread a good handful (50-100 g) per m² of Staldren® all over the pen.

Sick animals: Use Staldren® daily on the entire floor area.

Isolation: Use Staldren® on the whole floor area, both before and after the arrival or removal of animals, in order to reduce the risk of infection.

Empty pens: Use Staldren® in empty pens provides a good effect on viruses. The level of infection will be reduced and therefore, achieve a healthier environment for both the animals and people.

Poultry

Layers: Staldren® is used in the nesting box before the new hens are introduced. Spread a small amount in each nesting box (approximately 1 hand full (50-100 g). Spread Staldren® on all surfaces (100 g per m^2), or 1 x 25 kg sack per 250 m^2 floor coverage.

Use Staldren® once a week in the nesting boxes as well as on the entire floor area, to ensure the bacteria are controlled, the ammonia is bound and the moisture is absorbed, so that foot pad injury is minimised. It is a very efficient against Salmonella and Campylobacter (supplementary table).

Broilers: In a 1500 m^2 empty and clean chicken house, spread 75 kg Staldren® (50 g per m^2) either with a blower or spreader. When the area is completely covered with the "deep litter" then 50 kg of Staldren® is added on top of this. Once the chickens are in the house, spread another 50 kg of Staldren®, once a week until the birds are slaughtered. With a very wet environment or a problem with bacteria, increase the amount of Staldren® used.

If a blower is used in the empty chicken house, Staldren® will also have a good effect on viruses. Staldren® is a pH neutral product, beneficial to the environment, both for chicken feet and egg laying. It gives a minimum amount of dust and is easy to spread whilst giving a pleasant smell in the poultry house.

A product from J.N. Jorenku

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CIBENZA® DP100

提高家禽日粮中蛋白质的消化率

家禽养殖业者都知道饲料是生产中最重要也是最昂贵的部分。事实上，饲料占总生产成本的70%。现今的饲料成本不断地上升，肉鸡和蛋鸡的生产业者需要一个解决方案，在不损害家禽生产性能的状况下，“调整”饲料配方，节省饲料成本。

近日，Novus International, Inc.介绍了CIBENZA® DP100饲料添加剂 – 一种热稳定、广谱的单一蛋白酶活性，补充动物的内源性酶以水解不易消化的动物性和植物性蛋白质的组成成分- 肽和氨基酸 - 直接被肠道吸收。然而，内源性酶分解一些蛋白质来源的效率不会比外源性蛋白酶来得好，尤其是小鸡都会比大鸡的效率差。

一般普遍的误解是饲料原料中蛋白质的消化率已经够高，特别是黄豆粕。虽然大豆蛋白的消化率较高（一般为85-90%的氨基酸消化率），这意味着约10-15%是不可被利用的；这也代表还有显著的机会通过动物日粮中添加蛋白水解酶改善氨基酸的利用率。无论是以粗蛋白或者是可消化氨基酸为基础，蛋白酶可为饲料配方提供更多的伸缩性；业者可使用更广泛的各种更具成本效益的蛋白质，同时配合较昂贵的饲料原料以保持动物的生产性能。除了节约成本的好处之外，蛋白酶还可以因为低蛋白日粮和更好的氨基酸消化率减少粪便中的氮含量。这使得家禽业者以较低的成本得到更多的效益，也满足了可持续生产的需要和消费者环保的期望。

酶在家禽日粮中的使用不是一件新鲜的事物。事实上，酶已经成为一个被广泛接受的家禽日粮元素。早期，大多数的酶专注于优化饲料的能量或磷的成分。CIBENZA® DP100的不同在于它可以让业者优化家禽饲料中的蛋白质成分。CIBENZA® DP100的蛋白酶可使用于一般饲料原料中的动物性和植物性的蛋白质成分。

减少蛋白质，不影响生产的性能：研究和丰富的商业经验表明，在没有影响生产性能的状况之下，CIBENZA® DP100允许生产者使用低于肉鸡或蛋鸡行业推荐标准的5%至10%的蛋白质和氨基酸日粮，提供可观的成本节约。

在近期的试验（50,000鸡/畜舍），探讨CIBENZA® DP100对低蛋白日粮之影响。

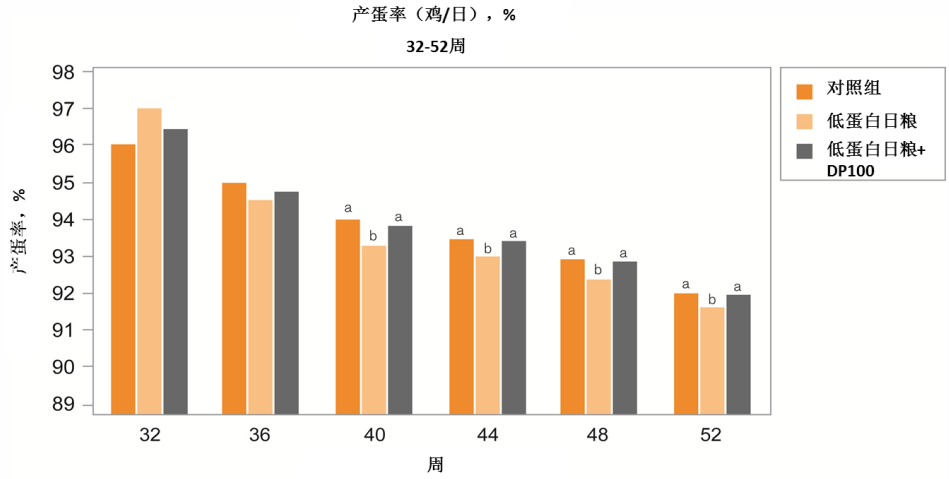
在这项研究中，日粮中的氨基酸减少了7.5%，比较添加CIBENZA® DP100处理组与标准的商业喂饲程序（0 - 45天）鸡只的生长性能。表一显示肉鸡日粮中添加CIBENZA® DP100不会影响生长性能，也降低了饲料成本。即使试验设施之间具有类似的性能指标(250-259，290-299)，CIBENZA® DP100仍然带来节省成本$0.04（0.128零吉）公斤/鸡。

表一、商业肉鸡试验 -比较所有的农场

农场	试验设备数量	平均增重（克/日）	平均调整换肉率	平均效率指数	平均成本（美金 公斤/只）
对照组	260	54.84	1.88	267	$0.83
CIBENZA DP100	3	56.88	1.86	281	$0.79
CIBENZA DP100 Cost Saving				$0.04（0.128零吉）	

在美国北卡罗莱纳州大学的蛋鸡实验（4032只母鸡，年龄32-52周）显示添加CIBENZA® DP100于低蛋白日粮（10%低于对照组日粮）的产蛋率（图一）和蛋重（数据未显示）与对照组无显著差异。

图一、32–52周产蛋率（鸡/日）



与同年龄组，不同的上标字母显示统计差异(P <0.05)
第一期（32-44周）：对照组22%粗蛋白，低蛋白饲料20%粗蛋白
第二期（44-48周）：对照组21%粗蛋白，低蛋白饲料19%粗蛋白
第三期（48-52周）：对照组20%粗蛋白，低蛋白饲料18%粗蛋白

摘要

蛋白酶的价值在于显著地降低饲料成本，业者还可以利用非传统的蛋白质原料。CIBENZA® DP100可以取代饲料中粗蛋白或氨基酸至10%，并达到相同的生产性能效果。另外，添加蛋白酶可以改善肠道健康，并由于氨基酸消化率的增加，在低蛋白的水平下满足动物的营养需求，从而降低氮的排泄。

创新产品替代抗生素用于饲养在炎热和潮湿热带地区的肉鸡

Zulkifli Idrus教授，马来西亚博特拉大学和Marie-Laurence LE RAY，Neovia，法国

简介

作为生长促进剂，抗生素被广泛地使用于亚洲，北美和拉丁美洲等国家。由于抗生素会导致抗药性的增强而影响人类和动物的健康，所以抗生素的使用引起越来越多的争议。

欧洲和韩国等一些国家已禁止使用抗生素作为生长促进剂。从畜牧业和经济的角度看来，使用替代品来取代抗生素是有效以及可行的。

本试验的主要目的是评估一种含活化铜的创新产品(B-SAFE)与杆菌肽锌(zinc-bacitracin)相比，对肉鸡生长性能之影响。在2012年，本试验在马来西亚博特拉大学进行，在东南亚地区测试产品的有效性。炎热、潮湿和热带气候是东南亚地区的主要特点，与当地的大学研究单位合作的成果可作为一个参考。

材料与方法

试验使用1680只一日龄Cobb 500雄性肉鸡饲养于传统的开放式鸡舍（图一），试验期为42天。

鸡只随机分配至24栏，每栏70只鸡。每只鸡占地0.077m^2。试验日粮为四种不同添加剂的粉状饲料，营养成分达到或超于Cobb 500肉鸡的营养需求（表一）。

表一

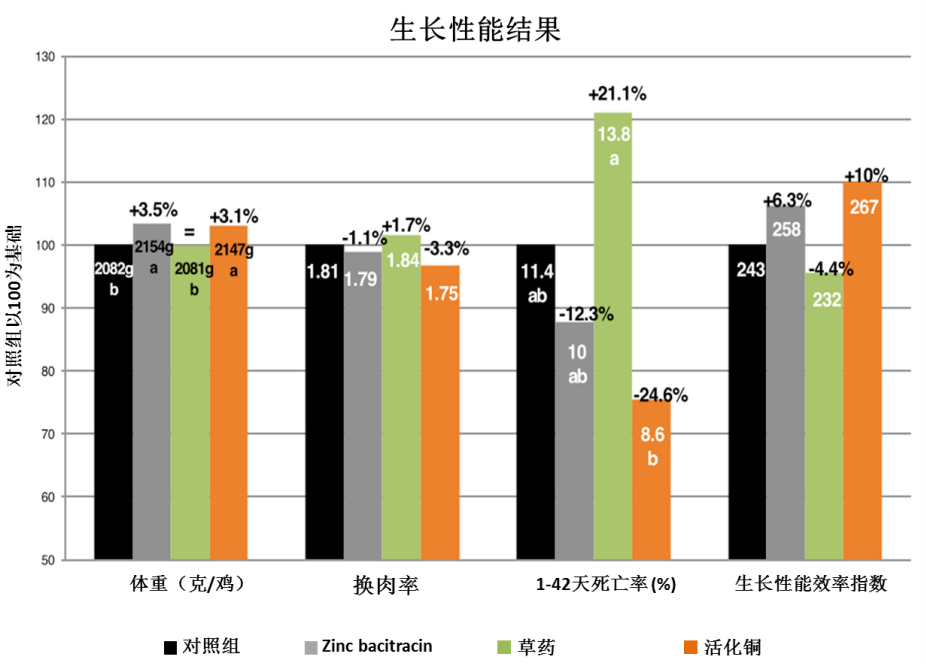
	小鸡（1-20天）	大鸡（20-42天）
A – 负对照组	A – 标准的肉鸡日粮	
B – 正对照组	A + 杆菌肽锌 (Zn Bacitracin) 25 ppm	
C – 竞争产品	A + 植物提取物 150 ppm	
D – B-SAFE	A + 200 ppm 活化铜	A + 100 ppm 活化铜

在第42天，测量生长性能参数和脚垫皮炎的发生率（评分为0-2）。

图一

结果

图二



比起负对照组，含活化铜为基础的产品和杆菌肽锌(zinc-bacitracin)可明显地改善体重和死亡率。由于活化铜导致较重的体重和其稳定性，饲料转化率也有下降的趋势。

因此，生长性能效率指数（日增重/换肉率的组合）与负对照组相比，提高了10%；而相较于其他饲料，含活化铜的饲料是最好的。本试验的结果显示喂饲添加植物提取物饲料组的生长性能并没有显著地改善。

关于脚垫性皮炎，杆菌肽锌(zinc-bacitracin)显著地降低了脚垫性皮炎的发生率（表三）。然而，每组的脚垫评分也相当高（评分为0-2）。

表三

日粮	负对照组	杆菌肽锌	植物提取物	活性铜
脚垫评分	1.43a	1.28b	1.52a	1.49a

结论

处于热带地区的东南亚，使用活化铜可有效地取代杆菌肽锌(zinc-bacitracin)作为生长促进剂。使用非药性的活化铜产品所带来的生长性能效果和抗生素的效果一样好，也是一个永续生产的方案。然而，使用活化铜并不能减少脚垫性皮炎的发生率。

铜是公认拥有良好的抗菌和促进生长的效果，所以，在某些国家，都会使用高剂量的铜。本试验所使用的铜连接于特定的铝硅酸盐粘土(aluminosilicate clay)。铜在于铝硅酸盐粘土的位置可有效地加强铜的抗菌效果（与病菌有较高的表面接触和交互作用），只需要使用小剂量即可发挥作用。这所带来的好处是活化铜能减少铜所带来的副作用（例如：交叉抵抗性和污染）。这项创新的解决方案已被验证适用于亚洲和它可让肉鸡生产者减少或停止使用抗生素作为生长促进剂。

如何预防肠道疾病侵略

Dr.Suraj. S, M.V.Sc.,
Zeus Biotech Limited，印度

前景何方?

一般上，肠道里有大约200-400种细菌。大部分居住于肠道的细菌会为寄主带来好处，它们防止寄主受到病原感染，分解复杂的饲料物质（帮助消化），产生维生素和其他有利于寄主的生长因素，包括肠道的免疫系统。然而，现代的管理系统需要强大对抗疾病的保障，特别是肠道部位。基于常规的使用抗生素作为生长促进剂所带来的风险，我们有必要寻找替代的方案。一直以来，使用良菌来对抗病原菌的想法都存在。以往人类食品中所含的乳酸菌已经开始普遍地使用在肉鸡和小猪日粮中。

肠道的防御墙

经常接触到病原菌和毒素的肠道是很重要的防御地带。肠道外皮表层都是选择性渗透来达到生物屏障的功能。肠道菌群会产生化学保护盾，其中包括了粘蛋白、酸碱值、其他的抑菌和杀菌物质。除了微生物屏障外，分泌抗体、T细胞、树突状细胞、局部淋巴集合肠系膜淋巴结组成免疫屏障。

肠道动态平衡

肠道一般会就正常、次要和机会主义菌群维持一个平衡点。胃里的强酸性pH值摧毁绝大部分由饲料带来的病原菌，接下来由胆汁和胰腺酶发挥作用。胃肠道的上端并没有很多样化的菌群。然而，胃肠道的下端含很丰富的菌群。这里就是菌群生产可以促进消化的维生素、酶和其他元素，同时间也确保病原菌受到控制。肠道的渐进蠕动可以帮助把消化物排出，也防止肠道的上端受到病原菌的感染。

肠道的扰动

肠道里最普遍发生的扰动是当菌群之间不达到平衡点，特别是当有害菌群主宰了有益菌群。消化扰动的造成是因为摄食大量不可消化的物质如非淀粉多糖、不适当地分泌消化液、毒素的出现（包括霉菌毒素），都会导致肠子肿胀，蠕动差和吸收差，以致有机会让向来迅速倍增的病原菌增殖并且导致疾病。紧迫、营养不足、摄取大量的快速被消化物质和同时间感染上病毒也是造成肠道扰动的常见因素。

怎样才可以最安全地预防肠道扰动?

1.管理策略:确保生产系统干净和生物安全措施。定期进行微生物审核以检测生物安全措施的成效。动物福利管理与措施防止动物没有受到过度的紧迫可保持良好的肠道健康。

2.营养策略:这需要和安全与均衡的可消化且符合营养需求规格的饲料配合。现今的畜牧业开始使用营养性的添加剂、益生元、酸化剂和乳酸菌皆是非常普遍的菌群。然而，绝大部分的菌可能不能够在胃里和肠道胆汁的情况下生存。目前的方案是运用孢子形成的自然生物。

芽孢杆菌是目前最佳的选择是因为它不仅防止病原的侵入凭借它抗病原体的活动（抑菌和杀菌物质如BLIS和枯草菌素），而且也因为它们有能力促进肠道菌群特别是乳酸菌的成长。

肠道紊乱的关键时期

3-7天的家禽和仔猪离乳时期特别容易受到影响。此外，紧迫，如接种疫苗和天气转换都可造成肠道紊乱。

所以，综合了管理和营养的策略，包括使用结合孢子形成直接喂饲菌群如MICROGUARD™、益生元、酸化剂和肠道蠕动促进剂是有效和可行的方案。

Maximillan Anderson博士于菲律宾Larrybeth农场所做的实验

剂量: -第1-5天：每1000只鸡20克
第6-35天：每1000只鸡10克

参数	MICROGUARD™	对照组
数量	7,135只	7,135只
死亡率	440只	502只
% 死亡率	6.17%	7.04 %
采食量	23,250公斤	22,900公斤
上市	6,695只	6,633只
总上市体重	13,090.25公斤	12,593.05公斤
平均活体重	1.96公斤	1.90公斤
换肉率	1.776	1.818
每公斤饲料成本（比索）	每公斤22.00	每公斤22.00
饲料成本/公斤活体重（比索）	每公斤39.07	每公斤40.00
每只鸡饲料成本（比索）	每只76.58	每只76.00
小鸡成本（比索）	每只22.00	每只22.00
价格/公斤活体重（比索）	每公斤74.00	每公斤74.00
销售总额/鸡（比索）	每只145.04	每只140.60
投入成本（饲料成本+小鸡成本）（比索）	每只98.58	每只98.00
毛利/鸡（比索）	每只46.46	每只42.60
从MICROGUARD™取得的毛利	每只3.86比索（0.27零吉）	

注：1令吉=0.07菲律宾比索

百奥滴(BioAktiv) – 有效、安全及经济有效的替代选择

尽管百奥滴(BioAktiv)这个德国品牌在亚洲还是一个新品牌，但是在过去十多年来，它已经遍布了欧洲和澳洲。和其他动物健康和生长促进剂不同的是百奥滴(BioAktiv)的产品采用了德国的传统医疗方法，称为‘天然氧活化’。经由天然氧活化，百奥滴(BioAktiv)产品可有效地催化多种好氧微生物的发展，特别是那些作用于动物消化系统、植物营养吸收及动植物废料生物分解的菌种。所以，百奥滴(BioAktiv)的产品提供一项替代的使用方案来提升动植物的健康与生长、粪便处理、制造堆肥、和废水生物修復技术。在过去的几年，百奥滴(BioAktiv)产品从欧洲一直开拓至澳洲、非洲和亚洲。

当动物摄取了百奥滴(BioAktiv)添加剂产品后，所谓的‘氧讯息’会催化好氧微生物的消化过程和促进营养分的吸收。这促使营养分更完整的被吸收进而导致更快地生长和整体动物的健康也会更佳。

百奥滴(BioAktiv)动物产品

百奥滴(BioAktiv)的产品可促进动物的健康和生长，分别为饲料和饮用水的添加剂。使用在猪只、肉牛/奶牛、羊、马和其他哺乳类的饲料添加剂称为*BioAktiv饲料添加剂*以及饮用水添加剂称为*BioAktiv Salis*。鸡只（肉鸡和蛋鸡）、鸭、鹅和其他家禽专用饲料和饮用水添加剂分别是*BioAktiv饲料添加剂-G*和*BioAktiv Salis-G*。其他用在动物的产品包括了*BioAktiv液体粪便处理剂*和专用来预防猪只疾病的*BioAktiv饲料添加剂-S*。

更高的经济有效性

百奥滴(BioAktiv)产品可以令营养有较好的吸收，这意味着减少饲料的浪费，从中改善换肉率和减低饲料成本。此外，平均日增重的提高导致动物上市体重增加，还可以更快地上市，同时节省了成本和时间。更佳的营养分吸收也代表动物有更健康，因此降低死亡率和药物的开支。所以，使用百奥滴(BioAktiv)产品可增加业者整体的盈利。

百奥滴(BioAktiv)如何操作

德国的GmbH百奥滴(BioAktiv)运用了一项专有的生产方式生产百奥滴(BioAktiv)产品。通过一种高能量的累加器，生产商在原料里装入一种特别的‘氧讯息’。百奥滴(BioAktiv)产品包括BioAktiv饲料添加剂和BioAktiv饲料添加剂-G的原料是纯正的白垩（碳酸钙，$CaCO_3$）。另外，BioAktiv饮用水添加剂，包括BioAktiv Salis和BioAktiv Salis-G，都是采用纯正的盐（氯化钠，NaCl）。

更佳的环境

良好喂饲的动物较满足和不会为了抢食而打斗。所以，喂饲含百奥滴(BioAktiv)产品的动物会比较安静和较少发生打斗。这样动物受伤的机率会比较少，方便管理。百奥滴(BioAktiv)产品确保饲料可以更完整地被消化，这减少营养分残留在粪便中，让细菌滋长和产生有害臭气体，也让农场周遭环境对工作人员和动物更理想。

科学印证

全世界很多国家的实验报告都已经证实了百奥滴(BioAktiv)的成效。其中一项最完整和权威的研究莫过于由澳大利亚猪只协会(Australasia Pig Institute)于澳洲昆士兰大学(University of Queensland)所做的研究。这项实验分为两组：试验组和对照组，每组选出10头母猪作为实验对象。接下来的实验注重在这些母猪的后代（刚巧每组各有104头仔猪）直到肥育阶段。一些显著的发现如下：

- 喂饲百奥滴(BioAktiv)的母猪采食多16%，离乳后体型评分比较好，泌乳期间体重的下降减少18%，母猪比较安静和平稳。
- 摄取百奥滴(BioAktiv)母猪的哺乳仔猪（第10-23天），平均日增重比对照组高出6%而且下痢的发生率少4倍。
- 摄取百奥滴(BioAktiv)的离乳仔猪（第24-56天）的死亡率比对照组少3倍，同时间换肉率提高7%。值得注意的是百奥滴(BioAktiv)的离乳仔猪完全没有下痢，而对照组有15%的仔猪有下痢的现象，必须以抗生素治疗。
- 喂饲百奥滴(BioAktiv)的生长-肥育猪只（第57-140天）有10%较低的换肉率及平均日增重高出2%。其中有一头摄取百奥滴(BioAktiv)的猪只被抽出是基于受伤（不是生病所致），另外对照组有4头猪只基于生病而被抽出。
- **成本比较**：百奥滴(BioAktiv)提供了每头猪只2澳币（5.88零吉）的药物节省，另外饲料成本方面的节省达到了5.45澳币（16.02零吉）。这每头猪只总共节省了7.45澳币（21.90零吉）。

高成本效益

百奥滴(BioAktiv)产品的作用在于益生元的性质激活微生物。只要少量的产品就足以促进微生物的活性。由此可见，百奥滴(BioAktiv)是高效益的。百奥滴(BioAktiv)的建议使用剂量如下：

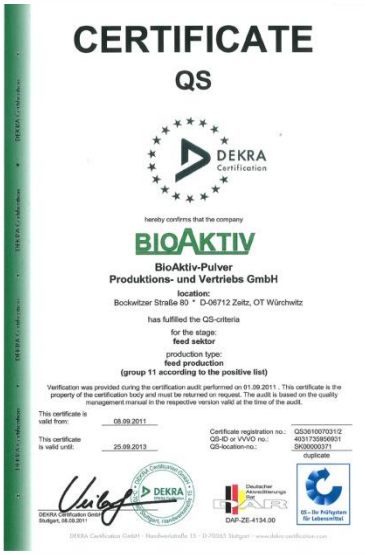
BioAktiv动物饲料添加剂和 BioAktiv Salis

品种	BioAktiv 动物饲料添加剂	BioAktiv Salis
猪	200 克/吨	1 公斤/15,000 公升水 湿喂: 200克/吨干料
牛	1-2 克/只/天	1-2 克/只/天
马	1 克/只/天	1 克/只/天
羊	0.5 克/只/天	0.5 克/只/天

BioAktiv for Animal Feed-G
每吨料添加200克
BioAktiv Salis-G
10,000公升饮用水里溶解1公斤然后用计量泵系统使用
每吨干料里混合200克，用于湿喂（包括酸的产品）

安全自然

用来生产百奥滴(BioAktiv)的原料全部来自天然的垩，食盐和苦盐（植物用BioAktiv，硫酸镁$MgSO_4$）。这些原料皆对动物、植物、人类和环境都完全无害。百奥滴(BioAktiv)产品的功效源自德国传统的治疗方法，既是‘天然氧活化’。这产品不含任何活性化学或生物物质。‘氧气信息’具备的能量是琐细的，因为它作用在于诱导，而不是通过接触微生物来激活子生态系统，有利于微生物运作流程。此外，百奥滴(BioAktiv)所需的剂量是非常的少（用在猪只是200ppm），因此，非常安全。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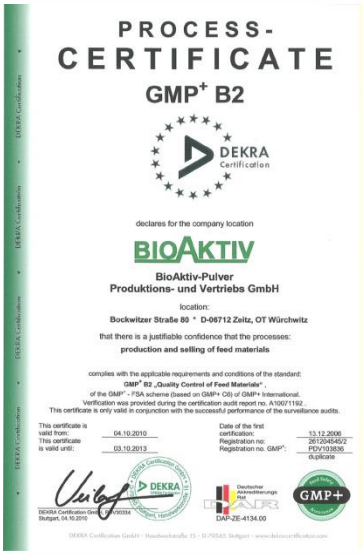
QS
DEKRA Certification
hereby confirms that the company
BIOAKTIV
BioAktiv-Pulver
Produktions- und Vertriebs GmbH
location:
Bockwitzer Straße 80 * D-06712 Zeitz, OT Würchwitz
has fulfilled the QS-criteria
for the stage:
feed sektor
production type:
feed production
(group 11 according to the positive list)
Verification was provided during the certification audit performed on 01.09.2011 . This certificate is the property of the certification body and must be returned on request. The audit is based on the quality management manual in the respective version valid at the time of the audit.
This certificate is valid from: 08.09.2011
This certificate is valid until: 25.09.2013
Certificate registration no.: QS3610070312
QS-ID or VVVO no.: 40317306969931
QS-location-no.: SK00000371
duplicate
DEKRA Certification GmbH
Stuttgart, 08.09.2011
DAP-ZE-4134.00
QS – Ihr Prüfsystem für Lebensmittel
DEKRA Certification GmbH · Handwerkstraße 15 · D-70565 Stuttgart · www.dekra-certification.com


PROCESS-
CERTIFICATE
GMP+ B2
DEKRA Certification
declares for the company location
BIOAKTIV
BioAktiv-Pulver
Produktions- und Vertriebs GmbH
location:
Bockwitzer Straße 80 * D-06712 Zeitz, OT Würchwitz
that there is a justifiable confidence that the processes:
production and selling of feed materials
complies with the applicable requirements and conditions of the standard:
GMP+ B2 „Quality Control of Feed Materials“ ,
of the GMP+ - FSA scheme (based on GMP+ C6) of GMP+ International.
Verification was provided during the certification audit report no. A10071192.
This certificate is only valid in conjunction with the successful performance of the surveillance audits.
This certificate is valid from: 04.10.2010
This certificate is valid until: 03.10.2013
Date of the first certification: 13.12.2006
Registration no: 26120454/5/2
Registration no. GMP+: PDV103836
duplicate
DEKRA Certification GmbH
Stuttgart, 04.10.2010
DAP-ZE-4134.00
GMP+
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Inputs for Organic Agriculture
AGRECO
QUALITY CERTIFICATE
N° *QMA11079E.QZ11-1.V-7*
The certification body AGRECO R.F.GODERZ GMBH, D-37218, Witzenhausen/GERMANY certifies that the company
BIO AKTIV GMBH
Bockwitzer Str. 80 06712 Zeitz-Würchwitz Betrieb-N° *QMA11079E*
Introduced and applies a quality assurance system for the scope of the products listed below. The production and control standards are, as far as legally permissible and possible, designed according to legislation on organic farming. This is monitored by the independent certification body AGRECO using the AGRECOStandardControl-System.
The evaluation of the products listed below in terms of the legislation on organic farming showed, that their use in organic agriculture is permitted, according to Regulation(EC) N°. 834/2007 and Regulation (EC) N° 889/2008.
1. SINGLE FEED STUFF – usable in organic farming acc. to Regulation (EC) N°. 834/2007 and Regulation (EC) N°. 889/2008:
BioAktiv for animal feed / BioAktiv liquid
2. PLANT STRENGTHENER - usable in organic farming acc. to Regulation (EC) N°. 834/2007 and Regulation (EC) N°. 889/2008:
BioAktiv for plants
3. TREATMENT AGENTS - usable in organic farming acc. to Regulation (EC) N°. 834/2007 and Regulation (EC) N°. 889/2008:
BioAktiv for liquid manure / BioAktiv for compost / BioAktiv for water
Scope defined by the product list of 24 of June 2011 / Initial Inspection of 24 of June 2011 / Validity of certification: until 31 of December 2012 at the latest.
Conditions/ Restrictions: AGRECO assumes no responsibility for warranted product specifications or -qualities. National approvals and registrations for these products must be performed by the offering company on its own responsibility. AGRECO does not function in this regard. This approval requires continued compliance to the basic standard of examination and a continuous inspection process. This is not a certificate acc. to article 29 (1) of Council Regulation on Organic Agriculture. The validity of this certificate ends upon termination of the mandate or in case of non-conformity with the basis standard or in case of any modification of the composition of the product submitted for certification. It is owned by AGRECO and has to be returned to AGRECO on request.
Issued by AGRECO in Witzenhausen / Germany, 1st of November 2011
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AGRECO R.F.GODERZ GMBH
I.A. Dipl.-Ing. ANTJE DETURK
(Responsible for Certification)
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品质认证：百奥滴(BioAktiv)动物用的产品经饲料生产的QS认证、生产和销售过程GMP+和Agreco有机农耕原料来源认证。

总结

如今，百奥滴(BioAktiv)是一个全球无数的饲料厂和农民信赖的品牌，特别是对盈利敏感且格外注重品质的欧洲饲料厂和农民。百奥滴(BioAktiv)产品已被证实为一个有效、节省和带来经济效应的产品。

J.N.Jorenku

Staldren - 有效的干性消毒产品

Staldren®是一个源自丹麦对环境无害以及有效对抗细菌和真菌芽孢的干式消毒产品（参考补充文件）。它不含磷和pH值为中性，不会腐蚀地板或栏位，也不会导致动物皮肤太过干燥进而容易擦伤或割裂而导致细菌感染和疾病。

使用Staldren®时不需戴手套。它吸附氨，使畜舍内的人工作员和动物舒适和舒服顺畅。Staldren®能吸附湿气和水分，所以，它在高湿度的栏位显得格外好用。它也能消毒畜舍环境，减少感染，因此确保动物更健康。Staldren®适用于所有种类的经济动物，它对人体以及动物无害。

实验菌株	Staldren®		对照组不含Staldren®	
	一小时	两天	一小时	两天
大肠杆菌 0157	<10 CFU/ml	<10 CFU/ml	140 mio CFU/ml	>200 mio CFU/ml
黑麴菌 ATCC 16406	<100 CFU/ml	<100 CFU/ml	150.000 CFU/ml	500.00 CFU/ml
芽孢梭菌 ATCC 13124	<100 CFU/ml	<10 CFU/ml	20 mio CFU/ml	1,9 mio CFU/ml
乳房链球菌 ATCC 9927	<10 CFU/ml	<10 CFU/ml	43 mio CFU/ml	1,9 mio CFU/ml
鼠伤寒沙门氏菌 ATCC 25241	<10 CFU/ml	<10 CFU/ml	>10 mia CFU/ml	>1 mia CFU/ml
金黄色葡萄球菌 ATCC 25923	<10 CFU/ml	<10 CFU/ml	100 mio CFU/ml	1,2 mia CFU/ml
猪链球菌 第7血清型	<10 CFU/ml	10 CFU/ml	1500 CFU/ml	6 mio CFU/ml
空肠弯曲杆菌 ATCC 29428	<10 CFU/ml	<10 CFU/ml	6 mio CFU/ml	>10 mio CFU/ml
克血白式肺炎菌	40 CFU/ml	40 CFU/ml	4,2 mio CFU/ml	36 mio CFU/ml

猪

分娩栏：分娩前，把Staldren®施撒于整个分娩栏，每平方公尺面积手抓一把的量（约50-100克）。分娩后，持续使用Staldren®连续3天，然后每周两次一直到离乳。在母猪后方和躺卧区周围（仔猪与母猪），及其它潮湿和有细菌滋长的地方应该加强密集使用。

保育栏：离乳后施撒Staldren®连续3天，然后每周两次。栏内各区和潮湿之处应确实使用。

肉猪栏：每周施撒Staldren®两次以减少感染发生进而制造更好的环境。

种猪栏：种母猪和种公猪栏内施撒Staldren®，每平方公尺面积手抓一把的量（约50-100克）。

病猪栏：每天施撒Staldren®于整个地板上。

隔离区：动物抵达或迁出前后，全区地板上施撒Staldren®，以降低感染的机率。

空栏：空栏内施撒Staldren®，以提供对抗病毒的良好效果。感染的机率因而减少，并且营造对人和动物更健康的环境。

鸡

蛋鸡：引进新母鸡前使用Staldren®。在巢箱中每平方公尺面积施撒手抓一把的量（约50-100克）。在所有表面上每平方公尺面积施撒100克的量，或每250平方公尺地板覆盖范围施撒一袋25公斤Staldren®。

每周一次在巢箱及整个地板施撒Staldren®，以确保细菌的数量受到控制，氨气被压制，水分被吸收，脚垫伤害降至最低。Staldren®对沙门杆菌及弯曲杆菌的杀菌效果非常好（参考补充文件）。

肉鸡：在1500平方公尺干净的空舍内，利用吹风管施撒75公斤的Staldren®（每平方公尺面积50克）。铺垫料后，在垫料上再施撒50公斤Staldren®。鸡只进入鸡舍后，在饲养全期继续每周一次施撒50公斤Staldren®。如果环境非常潮湿或有细菌问题时，应增加Staldren®的用量。

在空舍中利用吹风管施撒Staldren®以达到良好的对抗病毒效果。Staldren®是中性pH值的产品，对环境非常温和，而且不会损害鸡只脚部，也不会对产蛋有不良影响。Staldren®施撒后，迅速落下不扬尘，带给鸡只无臭味的舒适环境。

A product from J.N. Jorenku