

# Long-term performance with maximum egg production

*Profitable poultry and egg production are based on low conversion rate and good health status of the flock. Current outstanding genetics enables farmers to achieve excellent daily gains in broiler production or ideal laying curves in hens while maintaining very low food consumption. Our main role is to provide good-quality feed, optimal living conditions and, if possible, very good health. Only then we can expect outstanding economic performance of the farms.*

The way to reduce costs per unit of production, in this case eggs, consists of highest quality and efficiency of feed, adherence to all technological and management rules and work of dedicated staff. Another important factor which influences farm profitability is good poultry health and optimal body condition that is a key prerequisite for longevity of laying hens with persistent egg production.

ADDICOO GROUP is a company, which has been present on the Central and East European market for a long time and has 25 years of experience in the area of feed additives (formerly under the name of Delacon Biotechnik ČR). In 2012, the company launched a new product called Fortibac®, that was primarily designed to promote digestive tract development and its integrity as well as to reduce infectious pressure on farms. It is based on the fact that only a healthy digestive tract and efficient process of digestion can allow maximum use of feed nutritive value for growth and performance. Product was first tested both scientifically (Southern Poultry Research Inc. USA, Schothorst Feed Research, PNRC Stoškovice) and in field conditions (Czech Republic, Poland, Romania, USA, Russia) on broiler farms and subsequently in pigs during pre-fattening period. Results have confirmed that it is an excellent product able to maintain good animal health and to promote higher daily gains with reduced feed conversion at the same time.

The active ingredient of the product is a complex of modified organic acids (with short and medium chains). Modification – chemically neutral binding, product works also in high pH environment (intestinal tract) as opposed to free organic acids or their polar salts which are effective only at low pH (in the crop, stomach).

The active substance – modified organic acids stimulates the proliferation of enterocytes, resulting in faster intestinal mucosal regeneration and the formation of higher villi and shallower crypts. Better condition of villi leads to improved immune response and resistance of the digestive tract and also provides much larger area for optimal digestion and nutrient absorption.

The product serves as a quick source of energy not only for enterocytes but also for the positive microflora found in the digestive tract. Consequently, if present in sufficient quantities, positive microflora creates a competitive environment for pathogens and indirectly prevents their growth in the intestine.

Some of the active ingredients also have a strong antimicrobial effect, which is not limited to low pH environment as with organic acids but inhibits the pathogenic microflora throughout the digestive tract including the intestine (also effective at pH 7). The product is active against both G + bacteria (*Clostridium perfringens*, *Staphylococcus spp.*, *Streptococcus spp.*, *Listeria monocytogenes etc.*), and preventively against a number of G - bacteria (*Salmonella spp.*, *E. coli*, *Campylobacter jejuni etc.*). The active ingredients of the product are also excellent emulsifiers. Optimal lipase efficiency is reached with fat emulsification, i.e., the creation of the smallest possible droplets, which are then ideally mixed with the chyme to create a significantly larger surface for lipase activity and subsequent fat breakdown. This effect is not so significant for laying and breeding flocks, where feed mixtures, in contrast to broiler feeds, contain relatively very small amounts of added fats that, unfortunately, are frequently difficult to utilize by poultry (animal fats).

## **Minimum inhibitory concentration (MIC) of Fortibac®**

	MIC (%)
<i>Clostridium perfringens</i> (Ugent 56, field strain)	0.15
<i>Salmonella enteritidis</i> (ATC 13076)	0.3
<i>Staphylococcus aureus</i> (CCM 4516)	0.15
<i>Lactobacillus fermentum</i> (CCM 4988)	0.9
<i>Bifidobacterium animalis</i> (CCM 91)	0.7

*Czech Agricultural University, Faculty of Agrobiolgy, Dept. of Microbiology, Nutrition and Dietetics, Prague, October – November 2013*

## Production results in hens

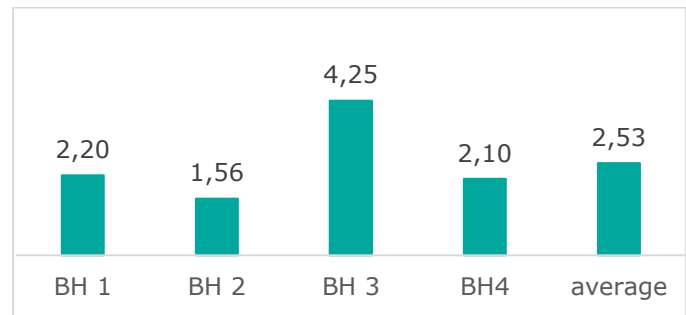
The next logical step in verification of wide-range efficacy of Fortibac® in broilers and piglets has been farm testing in laying hens performed both in production and breeding flocks. With regard to continuously growing demands on persistency of maximum egg production with good quality shell, it is clear that we need a product not only keeping good poultry health and condition, but also exerting positive effect on total egg production with expected quality.

We have collected data from several farm trials carried out in the territory of the Czech Republic, Slovakia, Romania and Poland. The product has been tested in total on nine farms with 333 200 hens, where 252 300 hens (five farm trials) were from production flocks and 80 900 hens (four farm trials) were from breeding flocks. The duration of application of Fortibac® in the tested houses was in the range of 10 to 30 weeks. In the experiments, the liquid form of the preparation was used to make the execution as simple as possible irrespective of the feed supplier and feed was absolutely the same in both groups. Dosing for operational reasons took place mostly five days a week at the recommended dose of 700 ml/1000 l water. In only one case, the powder form of the product at a dose of 700 g/t of the feed mixture was used in commercial laying hens but no difference in obtained results compared to the liquid product was observed.

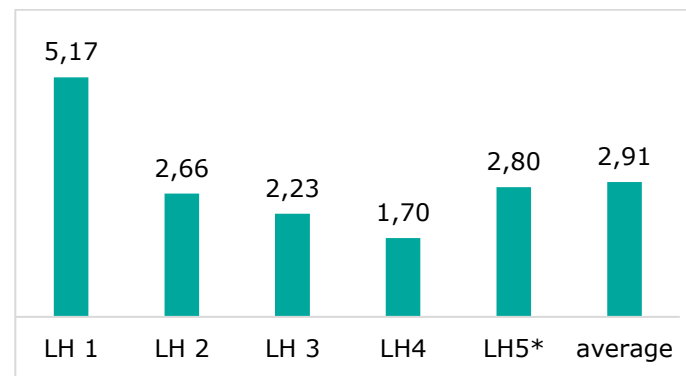
The overall summary of the results displayed in the graphs below confirms a clearly positive effect on egg production, which is on average by 2 to 3% higher (*charts 1 and 2*). The increase in egg production was not only due to higher percentage of lay, but also due to a greater stability of the laying curve, for example during a period of heat stress or stress caused by other interventions in the poultry houses (administration of a product against red mite, disinfection of the water system, vaccinations etc.).



**Chart 1: Average increase in egg production in breeding flocks (%)**



**Chart 2: Average increase in egg production in production flocks (%)**

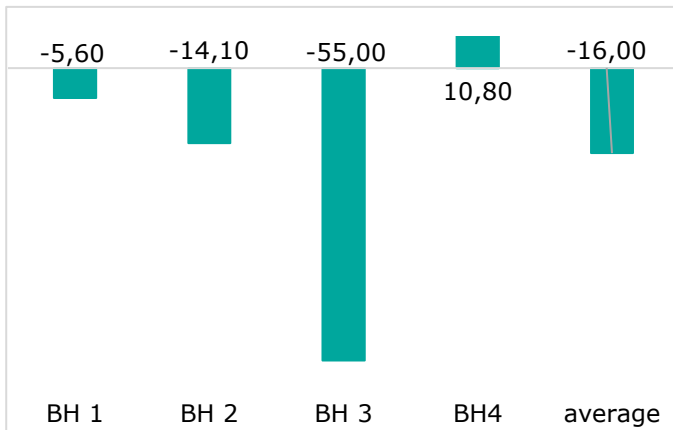


\* powder form

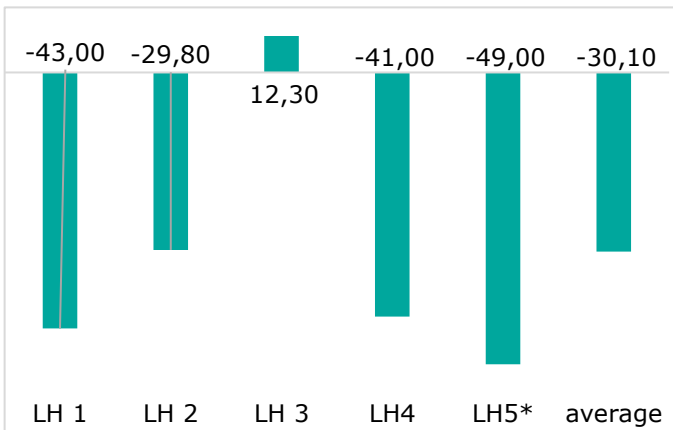
In addition, a predominantly positive effect on mortality on the farms in terms of reduction has been observed (*charts 3 and 4*). The individual results are placed in a wide range of numerical values, mainly due to the specific conditions, different phases of the laying cycle and very variable health status of the flocks on tested farms. However, we can expect mortality reduction by 2% during the whole laying period under optimal conditions (calculated from the initial number of laying hens in the flock). Reduced mortality is achieved mainly because of improved fitness and overall health of birds, whereas in some cases, lower mortality has been confirmed during ongoing virus infections in the flocks, when Fortibac® seemed to support proper functioning of the immune system of birds.

The charts also show the results of trials, where the product was administered in the houses with significantly higher mortality than in the control flocks. In those situations, mortality was not reduced under the level of control flocks, but it was stabilized on lower level than at the beginning of the experiment.

**Chart 3: Average reduction of weekly mortality in breeding flocks (%)**

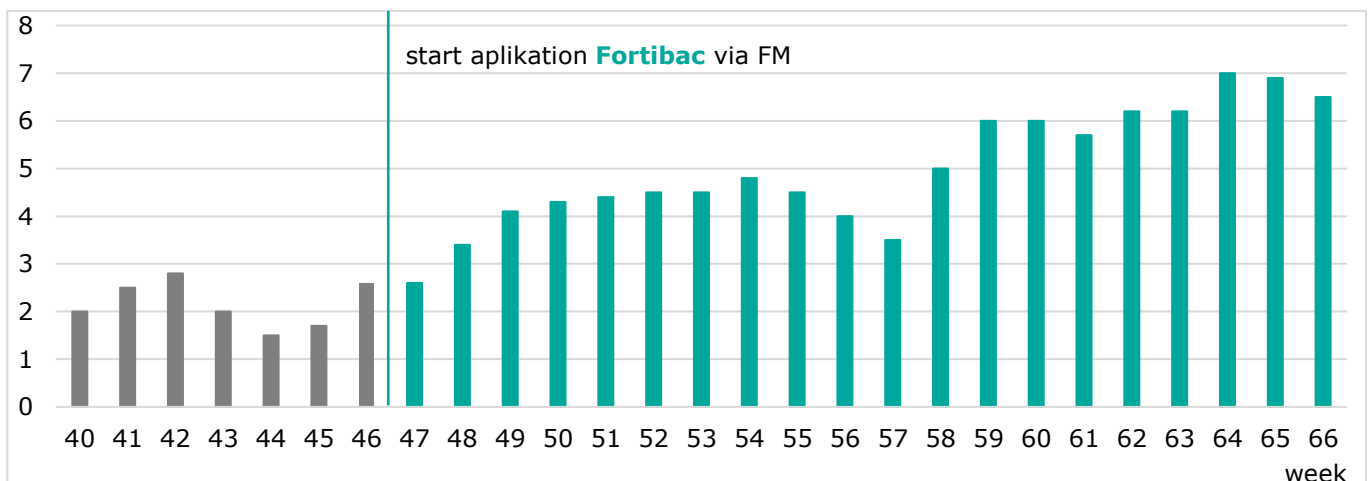


**Chart 4: Average reduction of weekly mortality in production flocks (%)**



\*powder form

**Chart: Difference in egg production in comparison with production standards (%)**



Other positive effects, subjectively evaluated directly on farms, are smaller contamination of eggs and lower litter moisture (in flooring houses), which is due to optimal fecal consistency confirming the optimal health status of the digestive tract. It is also related to lower incidence of cloacal prolapse and higher resistance to heat stress. An important parameter monitored in breeding flocks is the fertilization of eggs, which remained unchanged or with a slight tendency to increase in monitored flocks. There was also no change in the consumption of compound feed per produced eggs and that applies both for breeding and production flocks.

**Egg production economy**

In all monitored trials, a very interesting economic benefit has been evaluated with the use of Fortibac®. This was, as expected, significantly higher in breeding flocks, which is due to the price of hatching eggs. The return on investment with the application of Fortibac® was calculated at ROI 5-7:1 in breeding flocks and at ROI 3-6:1 in production flocks.

**Conclusion**

Since application has been discontinued due to the administration of vaccines and other supportive substances (e.g. vitamins), it is recommended that Fortibac® should be administered continuously in the form of powder via the compound feed to ensure the maximum and lasting effect. This option is economically more profitable and does not put the staff on the farm under the pressure of additional work.

It should be noted that a sufficient preventive effect against pathogens can only be achieved by continuous administration, which do not allow acute health problems to develop.

Fortibac® is to be used also in rearing of pullets to ensure a healthy, durable and balanced flock for future maximum egg production without the health problems associated with the digestive tract.