

Dietary fibre, economy and performance – polarities in poultry nutrition?

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Animal welfare, economy and performance have been the main objectives in poultry nutrition during recent years. After the ban of antibiotic growth promoters in the EU a lot of mostly plant derived substitutes have been offered to the market. All of these products have the legal status of 'natural products – botanically defined' according to EU regulation 1831/2003, though they are used for their zootechnical effects as a more or less tolerated practice.

Especially when using products based on volatile ingredients like essential oils, feed mills are sometimes facing inconsistent efficacy due to the complicated stability of such products during the production process (expansion, extrusion, pelleting) and during transport and storage in high temperature climates.

Dietary fibre essential

In recent years dietary fibre has been recognised as an essential ingredient in poultry diets for its effect on digestive health and eubiosis.

According to Pottgüter (2008) practical experiences with manipulating the fibre content of poultry diets show:

- Pullets learn sufficient feed intake to overcome the critical period of peak production.

Table 1. Feed trial in Germany (2009) with 543,200 broilers.

Trial period (days)	31
Inclusion rate of lignocellulose (%)	
Day 7-11	1.0
Day 12-29	1.5
Average daily weight gain (%)	+10.9
Feed conversion (%)	-4.1
European Broiler Index (%)	+16
<i>European Broiler Index = [average daily gain (g) x survival rate (%)] / [10 x FCR]</i>	



- Effect on the gut flora through 'feeding for gut health'.
- Stabilisation of digestion with a positive effect on litter condition and house climate.
- Reduced percentage of dirty eggs due to sticky droppings.
- Favourable impact on behavioural characteristics, such as aggressive pecking and cannibalism.

Due to the heterogeneous nature of dietary fibre a lot of different products of various sources have been tested for their efficacy, effect on digestive health, faecal dry matter, feed intake, performance and feed conversion and consequently on economy in poultry farming.

Dietary fibre products, based on lignocellulose, have remarkable advantages due to their high hygiene level in comparison with standard fibre sources like wheat bran, alfa alfa etc. (mycotoxins, bacterial load).

Furthermore these products develop their positive effects in low inclusion rates due to their high fibre concentration and therefore allow flexibility in diet formulation.

Synergistic effect

Modern lignocellulose products, designed for a synergistic, standardised combination of fermentable and non-fermentable dietary fibre, prove successful in poultry diets not only in respect of health status, litter quality and animal behaviour but especially in regard of performance and economy.

Several scientific feeding trials under practical conditions with high numbers of animals

reveal significant positive effects on daily weight gain, feed conversion and European Broiler Index (Table 1) as well as on the parameters of egg production, feed conversion and profit per number of eggs in laying hens (Table 2).

Fulfil physiological demand

From the nutritionist's point of view and from the view of animal welfare the formulation of a diet should fulfil the animal's physiological demand rather than try to compensate physiological imbalance with supplements.

Careful selection of the fibre source improves not only health but also has significant positive effects on the performance of both broilers and laying hens.

Physiological background is that fermentable fibre needs to reach the large intestine in order to stabilise the natural gut flora, control pathogens and produce beneficial metabolites which serve as an additional energy source. The lignocellulose, described in this article, is a recommended fibre source for poultry and proved successful under practical conditions. Its beneficial properties reveal positive effects on performance at a remarkable level, so that the additional use of 'growth promoter substitutes' appears to be outdated. ■

Ref: Pottgüter (2008): *Fibre in Layer Diets*. Lohmann Information Vol. 43 (2), Oct. 2008, Page 30

Table 2. Nine week feed trial in the Philippines (2009) with 6,500 laying hens.

Inclusion rate of lignocellulose (%)	1
Egg production (%)	+1.2
Feed conversion (feed intake per number of eggs)(%)	-6
Feeding costs per number of eggs (%)	-2.5
Profit on number of eggs (%)	+2