Litter quality enhancing properties

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The carob tree (Ceratonia siliqua) is an evergreen, leguminous tree that grows up to 15m high and is widely cultivated in regions which have an extended dry season, like the Mediterranean.

The carob seeds are used in different industries, such as the cosmetic, pharmaceutical and food industry. The pods, which comprise 90% of the weight of the fruit, are mainly used as an ingredient in animal feed.

Euroduna Group in Europe have been involved in the development and marketing of Caromic, a roasted and micronised carob powder which contains a relatively high amount of carbohydrates and condensed tannins.

There are indications that these components have intestinal health stimulating properties.

In the past carob pod has been used as a diarrhoea therapy and, more recently, the Pasteur Institute in Bucharest has demonstrated anti-infectious properties of Caromic in weaning piglet feed.

Importance of litter quality

The control of litter quality, which implies primarily the moisture content, is a priority in modern poultry production in order to reduce productivity losses and to avoid environmental and animal welfare problems.

Problems with litter quality are, in practice, often related to the limited choice of antimicrobial growth promoters, which does increase the risk of increased bacterial growth, and the ban on the use of meat and bone meal in poultry diets.

Nutritional factors can modify to a certain extent the quality of poultry litter, primarily by affecting water consumption and excretion.

Because of the possible intestinal health stimulating properties, the effectiveness of Caromic in broiler diets on litter quality and broiler performance has been studied at Schothorst Feed Research.

The poultry house has a capacity of 32,000 broiler chickens.

Experimental approach

Schothorst Feed Research has the use of a poultry house with a capacity of 32,000 broiler chickens. This house is divided into 32 experimental units each holding 1,000 chickens (see photo above).

This facility provides the opportunity to carry out research under conditions that correspond to a real life situation.

Therefore, the outcome of the research can be easily translated to broiler production in practice.

Experimental observations in the Caromic trial were feed and water intake and bird weight, which were recorded every day until slaughter at 38 days with weight plateaux and an automatic feeding system.

At day 38, bird weight was determined by hand. Litter quality was visually determined by five experienced staff on day 13 and 20. Experimental diets with and without Caromic were formulated according to common Dutch nutritional standard requirements for broiler chickens.

The main results obtained by Schothorst Feed Research (see Table 1) include:

- With 1% Caromic in broiler starter, grower and finisher diets a better litter quality and lower water/feed ratio were obtained during the fattening period.
- Broiler performance was not influenced with 1% Caromic in broiler diets over the total period of 38 days, but was better in between 0-31 days.
- With 2% Caromic in broiler feed, litter quality and water/feed ratio were even more favourable, but diets need to be corrected for nutrient dilution by Caromic to equal bird performance.

Practical implications

- Caromic in poultry diets can be used to prevent wet litter problems in poultry (broiler, layer and turkey) production and may increase economic profits in the commercial poultry industry in this way.
- In case of a high water/feed ratio, Caromic can be incorporated in poultry diets in order to prevent further derailment of the birds.
- Caromic in layer diets seems valuable to reduce the percentage of dirty eggs and to enhance manure quality, that is moisture content and moisture loss per unit time, as these are important parameters in practice. ■

Table 1. Results of the Caromic broiler study.

Period	0-16 days			0-31 days			0-38 days		
Treatment	**Control**	**1% Caromic**	**2% Caromic (nutrient corrected)**	**Control**	**1% Caromic**	**2% Caromic (nutrient corrected)**	**Control**	**1% Caromic**	**2% Caromic (nutrient corrected)**
Bodyweight (g)	493	498	494	1481^{a}	1508^{b}	1490^{ab}	2020	2034	2009
FCR1.373	1.358	1.356	1.580	1.567	1.572	1.658	1.672	1.679	
Water/feed ratio	1.945^{b}	1.914^{b}	1.834^{a}	1.923^{b}	1.896^{a}	1.872^{a}	1.913	1.888^{ab}	1.884^{a}
Litter quality[1)]	5.6^{a}	6.0^{a}	7.0^{b}	4.6^{a}	5.9^{b}	6.8^{c}	-	-	-

$^{a,b,c:}$ *Values with no common superscript in a row differ significantly (P<0.05).*
[1)] *Higher values indicate better litter quality.*