

# Omega-3 for young broilers – improves health and performance

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Mortality in broilers mainly occurs in the first week of life. After a couple of days the broiler runs out of maternal immunity and the development of their own immune system takes 7-10 days. This makes the broiler more sensitive to infections. In practice it takes 20-40 hours before broilers get their first meal. Long term feed withdrawal results in poor development of the intestines and low growth from start to finish (Table 1).

Research by Yi (2005) shows that supplementation with glutamine in the starter period results in a better gut morphology and immune response (Table 2). Glutamine stimulates proliferation of enterocytes, reduces free radical damage and activates lymphocytes.

According to Plumstead (2007) modern broilers have high demands for essential amino acids. By increasing the amounts of digestible lysine in early growth phases the performance can be strongly increased.

Eits (2004) looked at optimal amino acid balances and confirmed the increased demands of modern broiler breeds.

This knowledge was taken into account by Joosten Products when designing their product FMR Ω 3 as it contains high amounts of well balanced digestible amino acids and omega-3 fatty acids, which contribute to better health and immune function.

## Suboptimal digestion

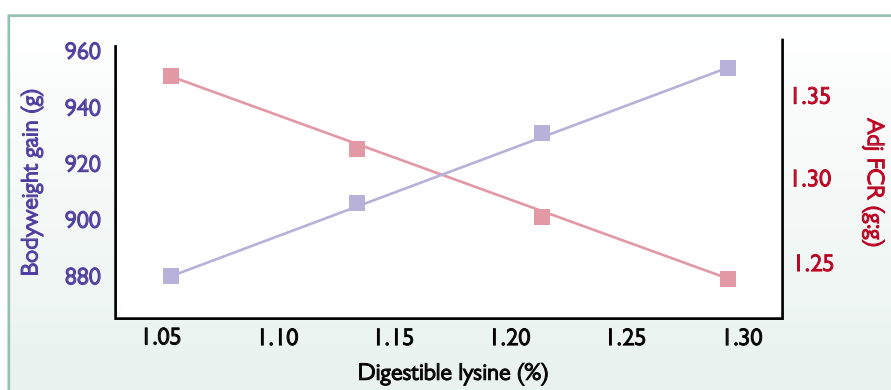
In the first weeks of life the digestive capacity of broilers is suboptimal (Fig. 2). Joosten Products have invested in unique processing of plant ingredients to increase the digestibility of the amino acids and energy.

**Table 1. Effect of fasting on growth of broiler (Gonzales, 2003).**

Hours fasting posthatch	Weight (day 7)	Weight (day 42)	Mortality (%)	Villus height
0	142 <sup>a</sup>	2065 <sup>a</sup>	4.4	17
18	132 <sup>b</sup>	2019 <sup>b</sup>	5.7	108
36	118 <sup>b</sup>	1975 <sup>c</sup>	6.2	109

**Table 2. Impact of glutamine on performance, morphology and immune response (Yi, 2005).**

	Weight (day 14)	FCR 0-14	Liveability day 14 (%)	Serum IFNα day 14 (ng/ml)
Control	386 <sup>a</sup>	1.23	97	181 <sup>a</sup>
Glutamine	416 <sup>b</sup>	1.18	100	154 <sup>b</sup>



**Fig. 1. Response curve of varying levels of digestible lysine on performance to 21 days (Plumstead, 2007).**

In young birds a finer particle size results in higher intake and digestion. In a digestibility trial carried out by Joosten Products the effect of grinding soya on its digestibility was compared (Table 3).

Both in vitro and in vivo the digestion improves as the result of the unique processing.

## Inhibit inflammation

In the first week of life birds are confronted with many infectious agents, yet they do not have a well developed immune system. These infections can result in inflammatory reactions with symptoms such as fever, lower weight gain and energy losses.

Humphrey and Klasing (2004) estimated that in normal broilers 1.5-2.0% of lysine is used for immunity, which increased to more than 10% after infection. In case of infection, weight gain will reduce temporarily by 10-20%. Of this decrease two thirds is related to lower feed intake and one third to the demands of the immune system.

Omega-3 fatty acids reduce the production of pro-inflammatory cytokines and

inflammation reactions. The result is an increased feed intake and weight gain.

When fed to broiler breeders the omega-3 content of eggs will increase. It is known that omega-3 stimulates blood supply of essential organs like the heart. The result is a reduced sensitivity for ascites.

	Normal	Very fine	Diff. (%)
Coeff dig CP	82.8	86	3.9
Coeff dig Fat	85.4	87.3	2.2
ME broiler	13.4	14	4.5
In vitro digestion CP	82	88	7

**Table 3. The effect of grinding soya on its digestibility.**

Schreiner et al (2005) compared omega-3 fatty acids with animal fat in feeds for broilers during the first three weeks of age.

Feeds with omega-3 increased intake, gain and conversion with 2.7-6.0 and 3.4% respectively. Halle (1999) showed that the use of fish oil in broiler breeders increased

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fertility by 3% and increased hatchability by 5%. Allen (1998) showed lower coccidial lesion scores when broilers were fed with omega-3 fatty acids. For the production of FMR Ω 3 Joosten Products uses a well stabilised triglyceride omega-3 fatty acid source.

## Floor pen trial

A broiler floor pen trial was conducted at the Dutch Institute, Schothorst Feed Research, in Lelystad. The trial was carried out using eight replicates per treatment with 1,000 Ross 308 birds per pen. The concen-

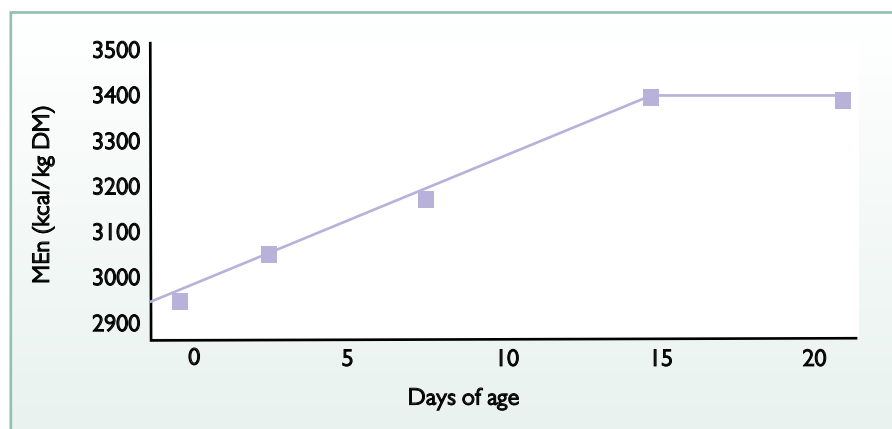


Fig. 2. ME Values for a corn soya meal as a function of age (Batal and Parsons, 2002).

trate feed was pelleted and, depending on the age of the birds, diluted with 10-30% whole wheat (Table 4).

Feeds were fed ad libitum. All feeds were calculated to have the same amount of ME and digestible amino acids. Trial feeds were compared in the first three weeks of age.

Afterwards all broilers received standard feeds. Feeding FMR Ω 3 in the first three weeks results in significantly better growth and conversion in comparison to the control with fishmeal. This difference in weight gain at three weeks remains until the end.

Due to a better start with FMR Ω 3 broilers do better until the end.

## Conclusions

- FMR Ω 3 should be used at a rate of 2.5% in feeds for broiler breeders in the first layer phase and for broilers at the start.
- The product is composed of stabilised omega-3 fatty acids and specially processed plant proteins. The in vitro digestion is increased 5% due to this process.
- FMR Ω 3 contains high amounts of well balanced amino acids and extra glutamine.
- The functional nutrients in the product stimulate gut health and also the immune response.
- The use of FMR Ω 3 in broiler starter diets results in a significantly better performance. Calculated for Dutch price conditions its use increases the profit per 1,000 birds started by more than €20. ■

References are available on request  
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Table 4. Broiler floor pen trial results.

	Control/ fishmeal	FMR Ω 3	Diff. (%)
Fishmeal (%)	2	-	-
FMR Ω 3	-	2.25	-
Gain (day 1-21)	824 <sup>a</sup>	846 <sup>b</sup>	2.6
FCR (day 1-21)	1.35 <sup>a</sup>	1.31 <sup>b</sup>	3.0
Gain (day 1-38)	2001 <sup>a</sup>	2026 <sup>b</sup>	-
FCR (day 1-38)	1.63 <sup>a</sup>	1.60 <sup>b</sup>	-