

Effective fiber nutrition for poultry

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“Effective fiber nutrition” implies that we are not just focused on the anti-nutritional effects of dietary fiber, an inevitable component when using plant feedstuffs in animal feed, but also utilize its potential positive effects on digestion and health.

The anti-nutritional effects of soluble fiber can be eliminated by addition of fiber-degrading enzymes to the diets, which has uplifted the energy value of many plant-based feedstuffs. Do we understand positive effects of other fiber components? In human nutrition, we are aware of potential benefits of dietary fibers for e.g. intestinal health, satiety and weight control, but what about animal nutrition? In young broilers we formulate nutrient-dense diets to maximise body weight gain and feed efficiency. How do fibers fit in?

Proper characterisation of fiber is essential to predict its effect on intestinal health and production performance, like ‘insoluble vs. soluble fiber’, or ‘fermentable vs. inert fiber’. Characteristics of fiber that we can use to improve (anti)peristalsis, and feed retention time in birds, to stimulate intestinal development, and nutrient utilization, and to improve microbial diversity in the intestinal tract, limit growth of potential pathogenic bacteria and production of short chain fatty acids in the hindgut. However, increasing the inclusion level of dietary fiber does not always result in improved production performance, and it can be questioned if we already understand effects of dietary fiber enough to speak about “Effective fiber nutrition”?

Commercial broiler diets generally contain max. 3% crude fiber. Nutritional recommendations for broilers mention a max. crude fiber content or do not mention crude fiber at all. For slower growing birds and egg-producing birds a minimum fiber content might be mentioned as a dietary diluent and for stress prevention. However, also in broilers, dietary supplementation with max. 3-5% inert fiber improves body weight gain and feed efficiency, effects that are at least partially caused by increased weight of the gastrointestinal tract. Experiments demonstrated improved nutrient utilization by inert dietary fiber supplementation, linked to gizzard development and digestive enzyme secretions and improved (anti)peristalsis.

Fermentable fiber can be used to reduce growth of potential pathogenic bacteria in the intestinal lumen and to diversify the intestinal microbiota, stimulate the production of short chain fatty acids in the ceca and improve water absorption from the hindgut. Although many positive effects of fiber are recognized, knowledge seems still too much fragmented to speak about “Effective fiber nutrition”, rather than using fiber for a specific target.