

Benefits of Combining a Probiotic and a Prebiotic in Your Poultry Diet



Key Points:

- Combining Probiotics and Prebiotics enhances performance along with food safety benefits
- Research indicates that BacPack®, a combination of *Bacillus subtilis* and IMW50™ (MOS product), reduces necrotic enteritis.
- Studies with *B. subtilis*, one of the ingredients in BacPack, has shown to increase egg production and chicks per breeder hen.

What happens when you combine a direct-fed microbial (a probiotic), with a MOS product (a prebiotic)?

Direct-fed microbials, or DFMs, are live bacteria that promote internal gut health. Studies show that good bacteria proliferate and bad bacteria are reduced in poultry fed QTI's *Bacillus subtilis*. Mannan oligosaccharide products, or MOS, are made from yeast cell walls and beta-glucans. They benefit poultry by keeping pathogens from binding to the intestine walls.

BacPack®, QTI's exclusive blending of *B. subtilis* with its MOS and beta-glucan product, IMW50™, provides a useful feed additive with several complementary modes of action to improve poultry gut health, live performance, and processing traits. By stabilizing gut microflora, supporting intestinal proliferation of lactobacilli and inhibition of pathogens (especially those that are antibiotic resistant and/or mucosa attaching and enterotoxin producing), mycotoxin binding, and improving nutrient digestion and absorption for better growth and feed utilization, this blend gives several advantages over either product used alone. Litter composting is facilitated by this pass-through strain of bacillus which can generate temperatures around 120° F within windrowed compost piles in poultry houses.

The yeast cell walls adsorb (agglutinate or strongly bind) pathogens such as *E. coli* and *Salmonella* species with mannose-seeking

lectins which would otherwise attach to the intestinal wall, colonize, and start to destroy tissue by toxin production. This may happen simultaneously with a coccidial challenge and lesions causing devastating consequences in morbidity and mortality, and performance.

Fresh fecal and litter sampling and microbial profiling typically demonstrates an increase in lactobacilli counts and lactobacilli/total anaerobes %, and a decrease in the *Clostridium perfringens*, *Salmonella* species, and coliform counts as a result of supplementing BacPack® to poultry feeds (whether mash or steam pelleted).

Replacement Pullets and Broiler Breeders

Skip-a-day or other feed restriction programs for replacement pullets and cockerels are necessary as a means of weight control but appear to put enormous stresses on the birds through constantly changing intestinal microflora. QTI research has shown dramatic swings in the fresh fecal lactobacilli/total anaerobes % from fasting (relative high %) to full feeding (relatively low %), apparently as an excess of feed intake following an off-feed day requires a while for the lactobacilli to re-establish itself in the digesta (with that lag time giving a cyclic pattern; our best guess). Use of BacPack® in pullet feeds has been beneficial in improving body weight uniformity and reducing pathogen loads. *B. subtilis* has been shown to improve egg production and reduce the number of cull eggs in broiler breeders, in addition to improving eggshell quality (shell thickness). These advantages lead to more chicks hatched per breeder hen.

Broilers and Turkeys

Hatchling chicks or poults are benefited by BacPack® in the prestarter or starter feeds by helping to establish a normal microflora in the intestinal tract and to prevent pathogens from taking up residence.

Better body weight gains, feed conversion ratios, integrity of the intestinal tract (villi) for gut health, and reduced pathogen loads

for food safety are usually observed by supplementing feeds with this product.

Immune modulation by the beta-glucans helps in disease resistance. A reduction in necrotic enteritis lesions during clostridial challenges with toxin producing strains is to be expected based on research.

Laying Hens

With the heightened concerns about *Salmonella* and egg recalls over the last few years, egg producers are looking to products that afford an extra measure of protection in this area as well as enhancing egg production, feed efficiency, and shell quality, and BacPack® fits this niche. Brown egg shell color is enhanced by *B. subtilis* in BacPack®, which may direct more eggs into premium grade in some countries. Some brown egg layer strains are more variable in the color of eggs they produce than other strains, so this feed additive offers support in those cases. Focal duodenal necrosis (FDN) can cause an increase in feed intake and yet a reduction in egg weight, but as a result of treatment with *B. subtilis* (based on a field trial in the Midwest) feed intakes and egg weights more closely approach normal.

Furthermore, BMD® which is the usual drug treatment may be used in combination with *B. subtilis* or BacPack®, and the DFM treatment may be continued as BMD® is used intermittently.

Conclusion

QTI's *B. subtilis*-based DFM, and BacPack®, the blended combination of DFM and IMW50™ (with its pure yeast cell wall attributes), have received considerable market share in poultry feeds for meat, table egg, and fertile egg production, over the past decade. They offer a first line of defense against pathogens in feed and in the gut, as well as promoting better nutrient utilization for enhancing health, growth, reproduction, and processing (of eggs and meat).



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