

TECH REPORT | Poultry

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ANIMAL HEALTH & NUTRITION

Reasons to Use DFMs, Especially “On Litter”

Key Points:

- Improves feed efficiency
- Promotes balanced microflora
- Reduces harmful pathogens
- Works with antibiotic free (ABF) diets
- Pathogens in litter can be reduced

Gut Microflora Stabilizer

For poultry raised “on litter” (an environment which gives the birds access to their own droppings), there can be both positive and negative implications.

Because pathogens reside in litter and manure, (for example, *Eimeria* oocysts, clostridial spores, viruses, etc.), a gut microflora stabilizer is important to keep these harmful microorganisms from proliferating extensively, creating disease and resulting in morbidity or mortality. The good news is that when these harmful pathogenic microorganisms are controlled, the birds can actually acquire natural early immunity to them.

On the other side of the coin, if the amounts of these pathogens get out of control, they can spell disaster for the flock. Treatment-resistant forms can add a more elusive path for recovery.

So How Do DFMs Help?

In the case of CALSORIN®, a direct-fed *Bacillus* microbial available from QTI, the aerobic beneficial bacteria are ingested and germinate within the digestive tract. Upon germination, these direct-fed microbials consume oxygen making the digesta condition more anaerobic. This creates a more advantageous environment for the beneficial *Lactobacilli* species (which are facultative anaerobes).

The native *Lactobacilli* species proliferate in this anaerobic environment, allowing them to occupy the intestinal mucosa (colonize) or the lumen of the intestine (volumetric space) in the digesta. Their proliferation in the digestive tract produces lactic acid that can improve gut health, nutrient digestibility, live performance (meat or egg production), and carcass characteristics.

However it is significant to note that not all *Bacillus* strains have the same aggressive aerobic tendencies as CALSPORIN®, making this component of how DFMs work in the digestive tract less viable for other strains.

Bacillus strains of DFMs are also known to produce enzymes to extract nutrients from feed ingredients. In studies, the specific *Bacillus* strain in CALSPORIN® has been shown to produce a “zone of inhibition” on culture media when challenged with *Clostridium perfringens*. By creating a competitive environment, the *Clostridium* is not able to proliferate.

It is theorized that similar interaction occurs within the intestinal tract. The microflora competition shifts to beneficial strains and stabilizes these microflora populations during stressful periods such as poor litter quality, heat stress, mycotoxins, high stocking density, and so on.

Efficacy Alone or In Combination With Antibiotics

Antibiotics and DFMs have different modes of action, allowing some DFMs to be used in conjunction with antibiotics. It is also possible to use DFMs alone as an alternative to antibiotics. In either case, both scenarios show improvements in performance.

Antibiotics such as bacitracin and virginiamycin are cost effective for broiler production. Yet the rapid development of resistant strains of intestinal bacteria and relentless pressure by consumer advocate groups to eliminate antibiotics used for growth promotion make the availability of DFMs important. Some companies prefer to keep antibiotics in their feeds as long as these compounds are legal and marketing of products is successful. Still, many of these same companies understand they need to learn more about DFMs and are incorporating their usage in their operations with the uncertainty of future government regulations.

Other companies want to try to accommodate the preferences of more customers by moving to a position of antibiotic growth promoter-free production. As an alternative to antibiotics, DFMs



show performance and benefit. Cost figures have steadily improved with DFM products in recent years and likely will continue to improve. CALSPORIN®, for example, when used in combination with either BMD® 50 or 25 g/ton or Stafac® 20 or 10 g/ton, has been shown to enhance performance over antibiotics alone with consistent improvements in feed conversion ratio.

With the action in the intestinal tract to promote a balanced microflora and a healthy gut, the direct health benefits of using a DFM such as CALSPORIN in the poultry industry typically includes improved bodyweight gain, feed conversion ratio, pathogen reduction, egg shell thickness, and brown egg color improvements.

Pass Through Benefits in the Litter

Along with the benefits within the animal's gut, there is another positive effect of direct-fed microbials. DFMs pass through with excreta and some microbials provide beneficial effects while residing in manure or litter.

The *Bacillus* strain in CALSPORIN® was obtained from the soil in Japan and it thrives in organic matter such as chicken or turkey manure or litter. Once it passes through, it can help in the reduction of pathogens in the litter itself, benefiting the present flock while keeping levels under control long term.

With improvements to protein digestibility, CALSPORIN® has been shown to reduce fecal nitrogen and ammonia volatilization from litter. In addition, since the strain is mesophilic, the microbials within the litter can aid the windrow composting process between flocks. Broiler growers that consistently compost litter during the downtime between flocks observe better performance and rankings in subsequent flocks.

Conclusion

DFMs have been shown to benefit poultry growers profits through increased performance in the animals when used with AGPs or without. In addition, secondary benefits of DFMs, like CALSPORIN®, can be seen in lowering pathogens in the litter. If you want additional information, please contact us at QTI.

Note:

Direct-Fed Microbials (DFMs) have applications for several animal species. In this article we will be using poultry in our examples. Although it would be impossible to make claims across all species based on studies from a single species, we think the idea that gut health translates to healthier animals is somewhat universal. If you are interested in information about other species that you raise, don't hesitate to contact us.

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