Improving Piglet's Intestinal Eco-System

Gastrointestinal challenges can have a major effect on animal performance, especially feed conversion and growth rate. With the event of risk from pathogens to both animals and ideas toward food safety it is imperative that we get a total understanding of gut health. Understanding the gut ecosystem is the only responsible and sustainable endpoint that must be attained.

It is extremely important that further research be conducted to allow us to better understand how each organ of the pig's body functions. Many feel this research needs to begin with gut physiology and an emphasis on the large intestine. It is understood that the large intestine is the organ for the final phase of digestion in the pig. It's principal function is the breakdown of certain carbohydrates by the microflora under anaerobic environments to short-chain fatty acids (SCFA) and certain gases (hydrogen, methane, carbon dioxide).

Help to manage gut health with something new and different

Antibiotic use in the swine feeding sector is already being reduced. With this fact known, it is imperative that the swine industry find alternative ways to control the microbial ecosystem in production systems. Sustainable approaches to modulate gut microflora must be evaluated. Conceptual products like probiotics (gut inoculation) and certain botanicals (phytobiotics) are capable of modulating the gut microflora towards a favorable composition. One product that has gained interest across the swine feeding sector is a Resistant Starch (RS). RS refers to starch that is not absorbed by digestion in the small intestine and passes to the large bowel (large intestine) to beneficially modify the gut microbial population. It is important to recognize that not all resistant starches are the same. As we approach the use of RS for pig application, we need to recognize the different types of resistant starches.

As we review these resistant starches it is imperative that we focus on the RS that promotes the optimum concentration of the key SCFA's that are produced. It is felt by many animal scientists that the essential and key SCFA is butyrate. It has been proven that certain RS produce the greatest concentration of the salt, butyrate.

One hypothesis is that the correct resistant starch will produce greater concentrations of butyrate thus improving hind gut epithelium integrity as suggested by raising mucin sulfatation, lower luminal magnesium concentration, coupled with lower epithelial proliferative activity. The interest relative to mucin activity is considered to be an indicator of mucin maturity and can be associated with increased protection of the intestinal epithelium against pathogenic bacteria and certain proteases. Thus using the correct resistant starch may result in increasing the mucosal resistance to pathogenic bacteria and proteases.

It is understood that RS feeding regimes contained greater concentrations of butyrate in the colonic digesta. We know that butyrate is the preferred fuel for colonocytes. The presence of butyrate stimulates proliferation and inhibits apoptosis of normal colonocytes. This concept is important as another management tool in lower gut disorders by improving the overall ecosystem of the animals gut.

This was proven in a study by Miquel Nofraria, Ph.D., University of Barcelona, Spain in the Elsevier journal, Nutrition 23 (2007), pages 861-870 which taught us that butyrate production is a recognized fuel for colonocytes and modulates proliferation, differentiation and apoptosis of the cell.

To get a better understanding of the principles behind the RS concept a study was conducted by the University of Manitoba, under the direction of Dr. Martin Nyachoti, et al, in June, 2012. The objective of the study was to determine and quantify the effects of a proprietary product, MSP[RS]® Resistant Starch by MSP Starch Products Inc. at Carberry, Manitoba, Canada on weaning pig performance. The results confirmed some of the theory behind the benefits of the right RS sources. These results were;

a. Pig performance was good.
b. MSP[RS] supplemented diets had improved fecal consistency.
c. MSP[RS] supplementation resulted in a decrease in ileal and cecal digesta pH reflecting the greater butyrate production within the large intestine.
d. MSP[RS] supplemented pigs had a lower concentration of Branched Chain Fatty Acids compared to the control, reflecting a better ratio of fatty acid balance.
e. There was not statistical differences in ammonia-N concentrations, reflecting no adverse protein uptake.

This study did conclude that MSP[RS] did increase microbial substrate for fermentation in the large intestine allowing for an improved gut-associated environment for the microbiota enabling improved animal performance. The full study is available from the Sales & Marketing group at MSP Starch Products Inc.

In another study by Bhandari, et al., 2009 in the Journal of Animal Science 87: 984-993 suggested, again improvements in the intestinal eco-system with favorable shifts to intestinal microbial populations in baby pigs using MSP[RS].

The newborn piglet

There is no substitute for best stockmanship or management for the newborn piglet. Genetics or nutrition will not resolve problems by themselves to ensure pig profitability. One of the first aspects of piglet management is getting the pig dry, especially the area around the umbilical area, including the umbilical cord. It is understood that the suckling period is the shortest and very likely the most important stage of all the life cycles within pig production. If the piglet is chilled shortly after birth it is vulnerable to a number of disease challenges from a number of bacteria or virus. Unlike other species the sow does not lick its newly born offspring or offer assistance in finding the udders. We know that dry pigs will find their "dinner plates" quicker than wet and chilled piglets.

MSP[RS] is highly astringent and is an ideal drying agent that is free of chemicals that might irritate the piglets gut or skin. It should be applied as soon as possible after birth. Dust the piglets with MSP[RS] if possible and also place 1 cup / 230 grams on the creep area. Piglets like the taste of MSP[RS] and will consume it thus starting the gut protection benefit. MSP[RS] has been shown to be very effective in the reduction of the impact of the Pathogens Clostridium Perfringens and E Coli strains that are common causes of piglet scours. Generally, the use of 1 cup per day for 3 days provides protection against such scours. An additional use for MSP[RS] is just prior to the introduction of creep feed at day 8 to 10 of the piglets life. The consumption of MSP[RS] conditions the piglets gut allowing it to better digest the high level of protein in such feeds. This is most beneficial in transitioning the piglet from sows milk to this solid food.

MSP[RS] can provide very economical protection to all ages of swine, piglets in farrowing, the nursery, the grower and finisher areas. It has also been demonstrated to be beneficial to sows in both gestation and farrowing. It can be added directly to the feed. An inclusion rate of 20 lbs (9 kg's) per tonne has been shown to be most effective for animals of all ages.

What about a Return on the Investment?

It is well understood that the most critical period in the life cycle of the pig is from birth to weaning. On the average, about 2 pigs per litter are lost during this period. This article has described a new tool to help manage the intestinal eco-system of piglets to ensure the maximum number of pigs born survive the transition of weaning. The weaning of large litters of thrifty, heavyweight pigs is a key for a profitable swine herd.

It should be noted that MSP[RS] while shown to be most effective, is not intended to replace antibiotics. In the event of a severe enteric infection you should consult your Veterinarian who may prescribe same.

Conclusion

In conclusion a product like MSP[RS] offers great promise in terms of its ability to help give positive results in helping to manage the piglet's gut eco-system. This feature will be a factor in benefiting pig performance and overall efficiency and profitability.

Please visit our website at www.mspResistantStarch.com or call us toll free at 1-844-834-2702 for more information.

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