TECH TALK

High feed costs, feed their potential

Article Provided By:

Diamond V

Improve Ration Utilization

High corn prices, by-product costs, and other feed expenses can create challenges for cattle feeders and the beef industry. While feed costs may vary from year to year and from region to region, aside from the initial cost of the animal, feed represents the largest single expense within any operation. As a result, many producers will seek solutions to help improve feed digestibility and utilization, eventually saving them profit in the long run. Thankfully, there are some science-based solutions to help ensure optimum ration utilization.

Get More from Feed Investment

Diamond V's **Original XPC®** is a natural* fermentation-based product for use in all types of ruminant diets. Original XPC is foundational to digestive health and efficiency by balancing the rumen microbiota and optimizing the rumen environment. This improvement in rumen fermentation and digestive efficiency allows for more energy, protein, and other nutrients to be made available from the diet, thus helping to improve gain and feed conversion.

NaturSafe® is Diamond V's next-generation technology and most advanced digestive health and immune support product for beef cattle. NaturSafe provides all of the benefits of XPC and then some! Not only does NaturSafe support rumen fermentation and digestive efficiency at a level that is unparalleled by any other product (including XPC), but it also provides another unique benefit in its ability to help strengthen the immune system in situations where health challenges may arise (weaning, receiving, processing, heat stress, mycotoxin challenge, hoof health issues, etc.).

Both Original XPC and NaturSafe are highly stable compared to many other products on the marketplace. There is no need for refrigeration, and either product can go into various types of feeds or supplements, including dry or liquid balancers, pelleted feeds, minerals, or tubs. Both products can benefit conventional or all-natural feeding programs where producers are looking to get more out of their feed investment.

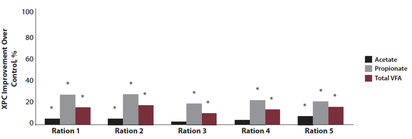
Figure 1: Comparing XPC and NaturSafe

	Research shows that XPC supports:	Research shows that NaturSafe supports:
GUT HEALTH		
Rumen Health	Yes	Yes Yes Yes
Microbial Balance	Yes	Yes Yes Yes
Intestinal Integrity	Yes	Yes Yes Yes
IMMUNE STRENGTH		
Starter Cattle Health		Yes Yes
Liver Health		Yes Yes
Protection and Response		Yes Yes
PERFORMANCE		
Dry Matter Intake	Yes	Yes Yes
Average Daily Gain	Yes	Yes Yes
Feed Efficiency	Yes	Yes Yes

More VFA = More Available Energy Per Unit of Feed

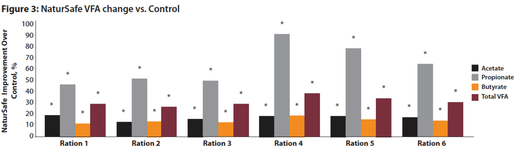
Research has clearly demonstrated the ability of both XPC® and NaturSafe® to increase rumen microbial populations, as well as increase rumen fermentation. By increasing the population of both starch and fiber-utilizing bacteria within the rumen, microbes can be more effective in turning feed into energy to be used for growth. Specifically, the effects of XPC were evaluated amongst five different feedlot diets from across the U.S. (Yoon et al., 2011). Diets comprised of various forage and concentrate levels, as well as ingredient composition, including dry rolled corn, high moisture corn, steam flaked corn, corn gluten feed, wet distillers grains, etc. Significant ($P < 0.05$) increases in 12-hour *in vitro* propionate (18.3–29.3%) and total VFA (9.5–15.1%) production were observed in all five diets as a result of XPC supplementation (Figure 2). A similar trial was later conducted with NaturSafe (Figure 3). Diets were different from that in the XPC trial, but again comprised of a wide variety of feedlot diets and ingredients. In this case, NaturSafe resulted in a significant ($P < 0.05$) increase in 12-hour *in vitro* acetate, propionate, butyrate, and total VFA production versus control, with advantages ranging from nearly 50% to over 90% higher than the control for total VFA production. These additional VFAs, a result of feeding either Original XPC or NaturSafe, are essentially extra energy that a beef animal can put towards body weight gain.

Figure 2: XPC VFA change vs. Control



Ration 1 (finisher): high moisture corn, wet distillers grains, corn gluten feed
Ration 2 (finisher): high moisture corn, wet distillers grains, dry rolled corn
Ration 3 (finisher): dry rolled corn, corn gluten feed, distillers solubles
Ration 4 (finisher): steam flaked corn, corn gluten feed
Ration 5 (backgrounder): dry rolled corn, hay, wheatlage, corn silage
Values with an asterisk (*) denote significant effects over Control ($P \leq 0.05$)
Yoon et al., 2011.

Figure 3: NaturSafe VFA change vs. Control

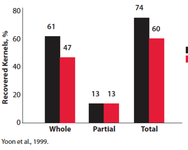


Ration 1 (backgrounder): corn silage, high moisture corn, corn gluten feed, hay
Ration 2 (finisher): dry rolled corn, corn gluten feed, earlage
Ration 3 (finisher): wet distillers grains, dry rolled corn, distillers solubles
Ration 4 (finisher): whole shelled corn
Ration 5 (finisher): steam flaked corn, wet distillers grains
Ration 6 (finisher): steam flaked corn,wet distillers grains, tylosin
Values with an asterisk (*) denote significant effects over Control ($P \leq 0.05$)
Diamond V Research & Innovation Center, 2017.

Less Corn in the Manure

For years, producers have stated that cattle consuming Diamond V product seemed to have less corn in their manure. Several years ago, scientists put this claim to test. Researchers used ruminally cannulated steers to place an equal number of whole kernels of corn into the rumen of steers fed either a control diet or a diet containing Original XP™ (a less concentrated version of XPC®) (Yoon et al., 1999). Through total fecal collections, researchers were then able to wash, screen, and sort whole kernels that came through in the manure. The results of the study showed that animals on the control diet excreted 61.0% of those kernels, whereas cattle on the XP diet excreted only 46.7% of the whole kernels that were placed into the rumen ($P < 0.05$) (Figure 4).

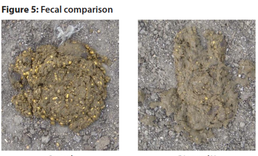
Figure 4: Corn digestion



Yoon et al., 1999.

A feedlot trial conducted in Western Nebraska looked at ration starch digestion a bit differently. In this study, 2214 steers were allocated across 14 pens, with half of the pens on control diet and the other half on Original XP (Western Nebraska Field Trial, 2009). One aspect of this study involved the feedlot veterinarian collecting representative fecal pen floor samples from each pen (Figure 5), pooling the samples, and sending them to the University of Nebraska for analysis. Scientists analyzed the diet as well as fecal samples for percent nitrogen and starch and were able to predict ration starch digestibility using the regression equation presented by Zinn et al. (2007). The results of the study showed that cattle on the XP treatment had numerically higher predicted starch digestibility, resulting in a 6.2% numerical advantage in feed/gain ratio.

Figure 5: Fecal comparison



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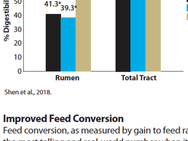
Greater Ration Digestibility

A more common approach in measuring diet utilization would be an *in vivo* total tract digestibility trial using an insoluble marker. Researchers at the Lethbridge Research and Development Centre compared rumen health and ration digestibility in steers fed feedlot diets with or without NaturSafe® (Shen et al., 2018). The results of this trial not only showed increased rumen pH and improved rumen health, but also showed significant ($P < 0.05$) increases in ruminal NDF and organic matter digestibility (28.1 and 18.1%, respectively) as a result of adding NaturSafe to finishing cattle diets (Figure 6).

Figure 6: Ration digestibility



Shen et al., 2018.

Improved Feed Conversion

Feed conversion, as measured by gain to feed ratio, is perhaps the most telling and real-world number when it comes to assessing feedstuff utilization and applying economics to the decision to include a supplement. Numerous trials have been conducted with Diamond V products across various situations where feed conversion has been measured. A meta-analysis, led by Dr. John Wagner of Colorado State University (Wagner et al., 2016), evaluated the effects of Diamond V Original products across 18 different experiments, representing 210 pen means and over 4600 head of cattle. Dr. Wagner's findings revealed that cattle fed Diamond V Original products through harvest had a significant ($P < 0.01$) improvement in feed conversion (2.8%).

Table 1: Results of Feedlot Meta-Analysis

Item	Control	Original Products	SEM	*P*-value
DMI, lb	20.22	20.31	0.95	< 0.05
ADG, lb/head/d	3.46	3.68	0.19	< 0.05
Gain:Feed (Feed:Gain)	0.177 (5.65)	0.182 (5.49)	0.0091	< 0.01

+6.4% ADG and +2.8% Gain:Feed

Wagner et al., 2016.

Summary

As we look now and into the future, feed costs will continue to be a top priority. It is important to consider what steps can be taken to help overcome this challenge. By incorporating NaturSafe® or Original XPC® into your feed, not only can you help your cattle grow faster, but it can support enhanced digestibility and feed conversion. This ensures your cattle are getting the most out of their feed, which is especially important during times when feed costs are being driven up by high corn and by-product costs.

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