



PORK BRIEFS

The Latest Information
on Swine Nutrition



NEW DDGS RESEARCH FOCUSES ON CONSUMERS

By Ken Palen

Most of the research conducted over the past several years on DDGS fed to hogs has focused on performance levels and cost reductions with the use of DDGS in diets. Ontario has been leading this change due to its geographical location to the new ethanol plants that have recently been built in Ontario and Michigan. Feed cost savings on different industry economic models are showing a range of \$5.00 to \$10.00 savings per hog in farrow to finish operations using 20% DDGS or 200 kg per tonne of feed.

There are always concerns with any new technology and research is needed to eliminate or alleviate these concerns. The concerns with DDGS were as follows and were mainly driven by performance and economics:

- Analysis too variable – constant growth and performance may not be possible.
- This material is high in fibre, therefore, feed efficiency will be reduced.
- Corn DDGS will be three times higher in mycotoxins than corn so we will not be able to use it for pigs.
- The high fat content could cause concerns with pork quality.

Many of these first concerns have been answered by numerous feeding studies conducted by Dr. Jerry Shurson and his colleges from the University of Minnesota and Dr. Hans Stein from the University of Illinois. The following three charts show a summary of the many studies with DDGS on performance, carcass characteristics and belly quality.

Chart 1 – PERFORMANCE

Summary of Growth Performance Responses from Feeding Levels up to 30% DDGS in Grower-Finisher Diets

Performance Measure	N	Increased	Reduced	Not Changed
ADG	25	1	6	18
ADFI	23	2	6	15
Gain/Feed	25	4	5	16

Source: Stein and Shurson, 2008

con't >>

Inside this Issue

NEW DDGS RESEARCH FOCUSES ON CONSUMERS

By: Ken Palen

Another Kenpal Customer has Success with Quality Premixes & Lacta-Fat™

"Kenpal consistently delivers me high quality Premixes and advice. I feed the AAP finishing program using 3 premixes and 4 rations, all with added Lacta-Fat™ on my farm.

I started feeding DDGS during 2008. My feed conversion in my finisher barn was 2.35 kg feed/kg gain for the entire year and my mortality has been between 1 and 2%."

Brian Willemse



69819 London Rd, Centralia, ON, Canada, N0M 1K0
Tel (519) 228-6444 • 1-800-265-2904 • Fax (519) 228-6560
kpalen@kenpal.on.ca • www.kenpal.on.ca

Volume 2, Issue 6
September 2009

Chart 2 – CARCASS CHARACTERISTICS

Summary of Carcass Characteristic Responses from Feeding Levels up to 30% DDGS in Grower-Finisher Diets				
Performance Measure	N	Increased	Reduced	Not Changed
Dressing %	18	0	8	10
Backfat Thickness	15	0	1	14
Loin Depth	14	0	2	12
% Carcass Lean	14	0	1	13

Source: Stein and Shurson, 2008

Chart 3 – BELLY QUALITY

Summary of Belly Quality Characteristics from Feeding Levels up to 30% DDGS in Grower-Finisher Diets				
Performance Measure	N	Increased	Reduced	Not Changed
Belly Thickness	4	0	2	2
Belly Firmness	3	0	3	0
Iodine Value	8	7	0	1

Stein and Shurson, 2008

From a performance perspective, most of the variability from different ethanol plants are being understood better by nutritionists. Diets are now being better formulated to the supply, while at the same time helping producers to get a maximum advantage. The trial results shown in Dr. Shurson and Dr. Stein's work show that top performance can be obtained when properly formulated.

The biggest impact on carcass characteristics seems to be that dressing percentage is slightly reduced. U.S. research by Dr. Guowu Xu, et. al. 2007 shows that for every 10% (100 Kg) of DDGS added to swine finishing rations there was a 0.5% reduction in dressing percentage. Newly released research by Dr. Edwardo Baltrouena and his colleges from the University of Alberta show a 0.4% reduction in dressing percentage with every 10% DDGS added to the grower and finisher diet. Although unknown at this point in time, Dr. Edwardo suspects this could be due to the extra growth of the intestinal tracts due to the extra fibre in the diets with the added DDGS. Looking at previous research and local Ontario observations, many suspect that this change to the intestinal tract weight may have a beneficial effect with less gut problems in pigs fed DDGS, thereby cancelling any negative impact of lower dressing percentage.

Belly quality characteristics such as reduced belly thickness and especially belly firmness are a concern on DDGS diets. This softer fat is to be expected, especially with higher levels of DDGS, due to the fact most DDGS tested is made from corn and therefore the fat sources in DDGS is corn oil. Table I and Table II can be reviewed to show the potential negative impact:

con't >>

Table I:

Typical Analysis – Fats and Oils						
Fatty Acids	LACTA- FAT AV	Hog Grease	Poultry Fat	Commodity Fat	Soybean Oil	Corn Oil
C14:0 Myristic	1.4	1.3	0.9	1.1	0.1	--
C16:0 Palmitic	21.0	23.8	21.6	17.3	10.3	10.9
C16:1 Palmitoleic	2.6	2.7	5.7	2.0	0.2	--
C18:0 Stearic	12.9	13.5	6.0	11.2	3.8	1.8
C18:1 Oleic	51.4	41.2	37.3	56.2	22.8	24.2
C18:2 Linoleic	9.6	10.2	19.5	9.9	51.0	59.0
C18:3 Linolenic	0.6	1.0	1.0	2.1	6.8	0.7
Iodine Value (Max)	69	64	78	78	130	125

Source: Lacta-Fat

If we look at the typical analysis of different fats and oils in Table I, we see that one fatty acid, Linoleic Acid (C18:2) is much higher in corn oil than hog grease. Due to the fact that pigs mimic what they eat – this high Linoleic acid level may result in more pale “grayish” coloured and softer pork if fed at high levels.

Table II

Other Analyses	LACTA-FAT AV	Hog Grease	Poultry Fat	Commodity Fat	Soybean Oil	Corn Oil
Unsaturated/ Saturated Ratio	1.8	1.4	2.2	2.4	5.6	6.5
Melting Point (°C)	36	37 to 38	31 to 35	31 to 35	-10 to -16	-5 to -12

Source: Lacta-Fat

In Table II you can see how much more unsaturated corn oil is than hog grease. You will also notice how much lower the melting point of corn oil is. Let’s remember corn oil is liquid at room temperature and bacon grease is not. Therefore, the key concern becomes how much DDGS should we put in the diet to limit the amount of corn oil we are adding to help keep pork bellies firmer. Table III shows the typical analysis of corn DDGS and dry corn on an (as fed basis).

Table III

Typical Analysis of Corn DDGS and Dry Corn (As Fed Basis)			
	DDGS	Dry Corn	Difference
Dry Matter %	90	87	-3
Crude Protein %	28	8	-20
Crude Fat %	10	3.5	-6.5
Crude Fibre %	7	2	-5
Total Lysine %	0.8	0.24	-0.56
Total Phosphorus %	0.7	0.25	-0.45
Swine M.E. (Kcal/Kg)	3430	3350	-80

Source: Shurson 2008, Feedstuffs 2009, Kenpal.

If we just look at the fat percentage difference between DDGS and corn we can see that for every 100 Kg (10%) of DDGS we add to the diet and take the equivalent 100 Kg (10%) dry corn out we are adding an additional 6.5 kg of corn oil per tonne of complete feed. Table IV shows how this can impact the rations at higher DDGS levels.

con't >>

Table IV

Impact of Different Levels of DDGS on Fat, adding per tonne of complete feed with equal dry corn removed				
DDGS %	10%	20%	30%	40%
Corn oil fat added after equal corn removed	6.5 kg	13 kg	19.5 kg	26 kg

Source: Kenpal Farm Products Inc.

This chart clearly shows the potential impact of adding higher DDGS levels to the diet. Most of the research done in the past with oils fed to hogs has always shown that over 2% (20 Kg/tcf) of oils could affect pork quality, especially firmness of bellies.

Withdrawing DDGS Before Market

Newly published research by Dr. Eduardo Baltronena and his colleges from the University of Alberta looked at withdrawing (not feeding) DDGS two to four weeks before market. Dr. Eduardo was able to show that if bellies are the most important commodity to the particular packer or if fat hardness is a concern, most of the negative impacts could be removed by withdrawing the DDGS two to four weeks before market. Dr. Eduardo also suggested that packers should pay a bonus to producers for any lost opportunity of feeding DDGS if this type of pork is required.

The Bottom Line

This recent DDGS research provides very good information which can help producers, packers, and nutritionists make good decisions on pork production. I think Ontario has chosen the best path of feeding 20% DDGS diets, thereby reducing the factors of variability of the supply, keeping added corn oil (fat) levels below most packer and consumer concerns and keeping the feeding of DDGS simple. Although withdrawal is now a proven option of DDGS before market, it is very difficult to implement at farm level.

Typically most farms ship approximately 5 shipments to empty a pen. If every hog is to receive at least 4 weeks withdrawal then the program would need to start 9 weeks before the first hogs are shipped. This is an extreme example but before making any promises to packer customers it is something that needs to be considered.

Thank you very much for allowing me to share some data and my thoughts with you and please be careful out in the fields at harvest time.

Published by:



69819 London Road, RR #1, Centralia, Ontario, Canada, N0M 1K0

Tel: (519) 228-6444 or 1-800-265-2904 • Fax (519) 228-6560 • Email kpalen@kenpal.on.ca • www.kenpal.on.ca

WE APPRECIATE YOUR BUSINESS