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Diet Choices Drive Carcass Fat Quality

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Abstract

Pork producers and their nutritionists are searching for ways to better understand how dietary fat influences the fat that is deposited in the pig carcass. Iodine value has become the focal point of this discussion.

Disciplines

Agriculture | Animal Experimentation and Research | Animal Sciences

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Diet Choices Drive Carcass Fat Quality

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By Trey Kellner and John Patience, Iowa State University, Ames, IA | Feb 15, 2012

Some alternative feedstuffs contain higher levels of unsaturated fats, which have brought the issue of carcass fat quality to the forefront. As a result, producers and their nutritionists are searching for ways to better understand how dietary fat influences the fat that is deposited in the pig carcass.

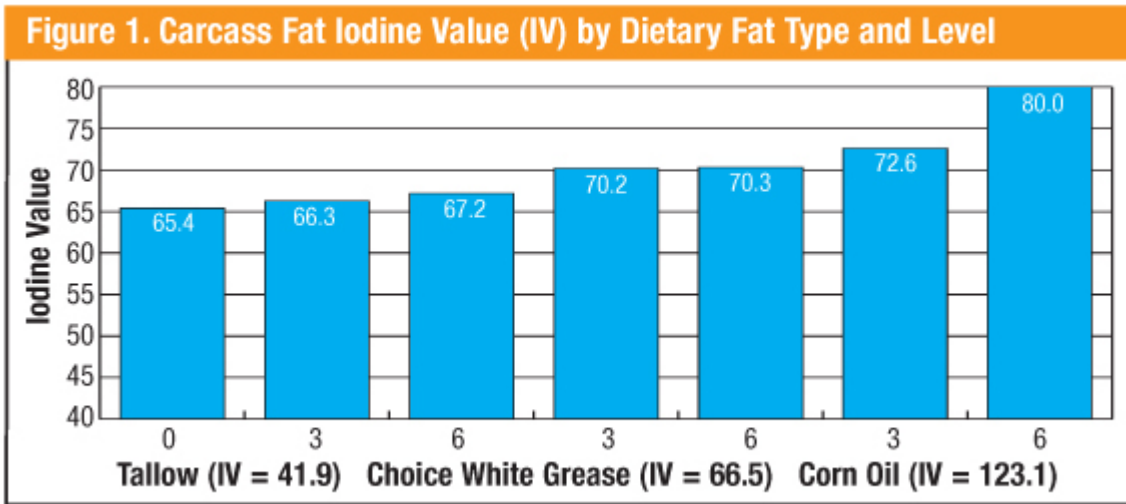
Iodine value (IV), used as a predictor of fat firmness in the pork carcass, has become the focal point of this discussion. Pork that is unsaturated or soft at room temperature has a high iodine value, while fat that is firm at room temperature has a low iodine value. Some packers have adopted this measurement as a standard of quality. However, there is surprisingly little research on this measurement.

How dietary fat content affects the deposited fat in the pig throughout the growth cycle needs to be thoroughly understood. Corn contains a small amount of unsaturated fat, while the ethanol byproduct, distiller's dried grains with soluble (DDGS), has higher concentrations of unsaturated fat — about three times that of corn.

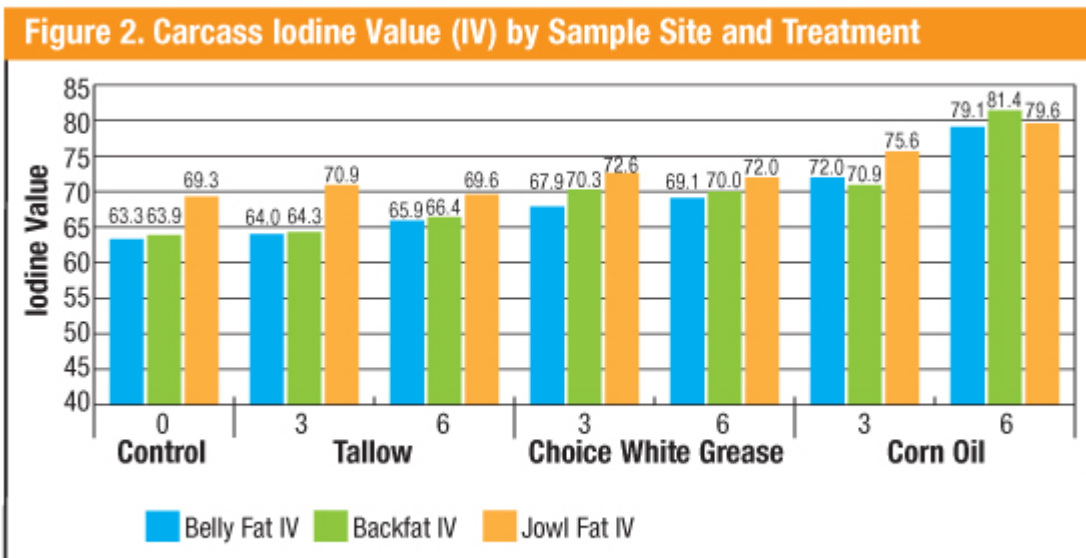
In an effort to better understand how unsaturated fat levels affect the composition of body fat in the grow-finish pig, Iowa State University researchers designed an experiment to track iodine levels from 165 lb. to marketing.

Individually penned pigs were fed one of six treatments: 3% or 6% of either tallow, choice white grease (CWG) or corn oil. Pigs fed a standard corn-soy diet with no added fat served as a control group.

In analyzing carcass fat samples, researchers were not surprised to find that carcass fat IV was affected by the unsaturation in the fat source. Unlike tallow or CWG, the IV produced by corn oil was affected by inclusion level. Corn oil at 6% resulted in the highest carcass fat IV — 80, while all other treatments resulted in carcass fat samples that registered an IV under 73 (Figure 1).



Sampling sites on the carcass also affect IV. On average, jowl fat IV was higher than belly or backfat measures (Figure 2).



If we assume that an acceptable IV is 74, then both CWG and tallow can be fed without concern up to 6% of the diet. However, it should be noted that the IV value of CWG can vary widely; the product used in this experiment had an IV of 66.5. Some CWG could have substantially higher IV values. Carcass fat IV was also affected by sex, with barrows lower than gilts (69.1 vs. 71.5). These results reinforce the importance of knowing the IV of fat source in the diet and the level at which it is fed.

In this experiment, adding 3% corn oil as a separate ingredient would be no different in practice than feeding 30% corn DDGS containing 10% fat. This helps producers determine how much corn oil, fed directly or as DDGS, can be included in their diets while still producing a good-quality carcass.

Table 1. Effects of Dietary Fat on the Performance of Finishing Pigs							
Item	Treatments						
	Control	Tallow		Choice White Grease		Corn Oil	
Level, %	0	3	6	3	6	3	6
Dietary fat IV ¹	–	41.9		66.5		123.1	
Avg. daily gain, lb.	2.05	2.40	2.35	2.18	2.44	2.29	2.46
Avg. daily feed intake, lb.	6.84	7.17	6.82	6.51	6.86	6.84	6.78
Gain:feed, lb.	0.66	0.74	0.76	0.74	0.79	0.75	0.81
Belly weight, lb.	18.26	20.24	20.24	19.14	20.90	18.92	20.90
Belly fat IV	63.3	64.0	65.9	67.9	69.1	72.0	79.1
Backfat IV	63.9	64.3	66.4	70.3	70.0	70.9	81.4
Jowl fat IV	69.3	70.9	69.6	72.6	72.0	75.6	79.6
Carcass fat IV (average)	65.4	66.3	67.2	70.2	70.3	72.6	80.0

¹IV = iodine value measured by a direct method through titration

As expected, average daily gain and gain-to-feed ratio were improved by added fat, confirming that increasing diet energy intake will increase barn throughput (Table 1), keeping in mind that diets high in unsaturated fats will increase carcass fat IV in a dose-dependent manner.

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