

Pork Prose

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With the recent drop in soybean prices, hog producers are again checking the economics of using soybeans (raw or roasted) rather than soybean meal in swine rations. Let's take a brief look at the feasibility of using the soybean for hogs. Much of the information below is taken from a recent review by Herkelman and Cromwell ("Feedstuffs," 1990, 62(52):13).

Raw Soybeans

Raw soybeans contain a number of compounds that interrupt the digestion and absorption of nutrients in the pig. The most significant of these compounds is trypsin inhibitor which limits protein digestion.

Feeding raw soybeans will depress growth rate and feed efficiency. In starter pigs, growth rate is reduced by about 50 percent (.61 vs. 1.23 lb./day), while feed efficiency is decreased by approxi-

mately 40 percent (3.58 vs. 2.12 lb. feed/lb. gain).

In grower-finisher pigs, the reduction in both growth rate and feed efficiency is less severe. Weight gains are impaired by 22 percent (1.38 vs. 1.78 lb./day) and feed efficiency is depressed by 19 percent (4.07 vs. 3.43 lb. feed/lb. gain).

In the early 1980s, research at the University of Nebraska showed that feeding raw soybeans to sows in both gestation and lactation had no deleterious effects. Their research included studies from sows over the course of three parities (litters). However, more recent studies suggest what some nutritionists have suspected -- that raw soybeans may limit milk production and baby pig survival. A summary of three studies in which raw soybeans (or soybean meal) were fed during both gestation and lactation is shown below.

EFFECT OF RAW SOYBEANS ON SOW PERFORMANCE*

Soybean Source	Pigs Born	Pigs Weaned	Weaning Wt., Lb.	Survival, %
SB meal	9.3	8.5	12.2	91.4
SB meal+ oil	9.5	8.6	11.2	90.5

* Summary of three separate studies.

As the table shows, piglet birth weights are somewhat higher from sows consuming raw soybeans during gestation. In the raw soybean group, survival rate of the baby pigs and weaning weights are slightly less. This is apparently due to a reduction in feed intake during lactation. The drop in feed intake also leads to higher sow weight loss during lactation (data not shown).

Low Trypsin Inhibitor Soybeans

Research with low trypsin inhibitor varieties of soybeans have been conducted at several universities. There is no question that these new varieties are superior to conventional soybeans when fed in the raw state.

However, reductions in growth and feed conversion still occur in starter, grower, and finisher

phases if the low trypsin inhibitor varieties are not cooked.

Soybean Processing

Soybeans can be roasted or extruded. In the roasting process, soybeans reach 230-260 degrees F 2-5 minutes after reaching the roaster. In an extruder, soybeans are forced through small holes, causing the soybean material to reach 300 degrees F in less than 30 seconds.

Which process is better? Both methods destroy the growth inhibitors. However, extrusion process ruptures the oil cells, which, according to some nutritionists, may improve oil digestibility. And in fact the oil cell rupture does increase oil utilization in the chick. Whether the same response occurs in the pig is less clear since few direct experiments have been

conducted to answer this question.

However, there have been a lot of indirect experiments to suggest that oil from ruptured cells is superior to that of oil from intact cells in the soybean. Herkelman and Cromwell looked at experiments conducted over the last 30 years. Using roasted soybeans increased growth rates by about 2 percent and improved feed efficiency by about 5 percent over that of soybean meal.

But researchers have, on the average, found that adding oil to a conventional corn-soybean meal diet also increased weight gains by 2 percent, but improved feed conversion by more than 8 percent.

Effect Of Soybeans On Carcass Quality

In experiments conducted since 1969, cooked soybeans in growing-finishing diets increased backfat by about 4 percent (1.29 vs. 1.24 inches) and decreased loin eye areas by roughly 3 percent (4.58 vs. 4.72 sq. inches).



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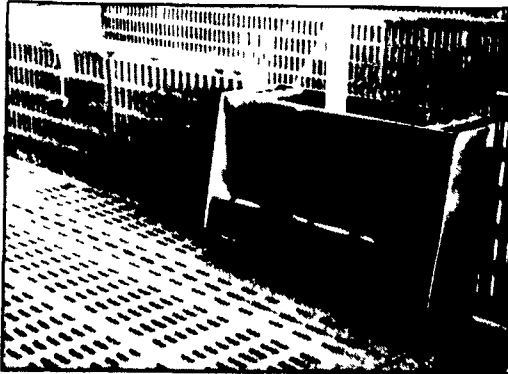


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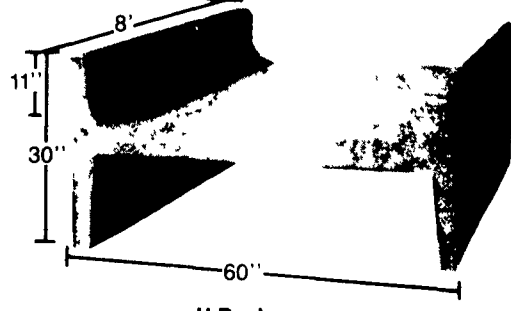
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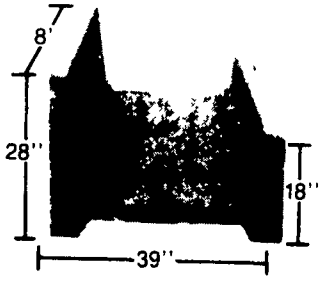
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