

FEEDING CRUDE GLYCEROL TO LACTATING SOWS

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During the production of biodiesel, 100 pounds of fat or vegetable oil (usually soybean oil) are combined with 10 pounds of methanol to yield 100 pounds of biodiesel and 10 pounds of crude glycerol. Glycerol is a three-carbon compound that could serve as an energy source in swine diets. Glycerol also plays a role in water balance of the body. Consumption of glycerol-containing water increased blood volume, and decreased heart rate, rectal temperature and urinary output of human endurance athletes during exercise in heat stress conditions. Glycerol's role in water balance may help lactating sows cope with the stress of milk production during hot weather. With these thoughts in mind, we designed a study to evaluate the effects of increasing concentrations of crude glycerol in diets for lactating sows. Three hundred forty five, mixed parity sows were assigned to corn-soybean meal based diets containing 0, 3, 6, or 9% crude glycerol. Crude glycerol contained 86.1% glycerol, 6.01% salt, and < 100 ppm methanol. Dietary treatments were imposed on day 109 of gestation when sows were transferred to a confinement farrowing facility. Until farrowing, sows were restricted to 2.27 kg/d of their experimental diet. After farrowing, sows were allowed ad libitum access to their experimental diet. The experiment began in July and concluded in November, 2007. Inclusion of up to 9% crude glycerol had no significant effects on sow weight or backfat losses, litter size or weight at weaning or wean-to-estrus interval for sows that displayed estrus by day 10 postweaning (Table). Dietary treatment tended ($P < 0.08$) to influence daily feed intake of sows mostly due to the difference in feed intake between sows fed 3 and 6% glycerol. An explanation for the lower feed intake of sows fed the 6% glycerol diet is not apparent. Results of this study suggest that lactating sows fed diets containing up to 9% crude glycerol perform similar to sows fed a standard corn-soybean meal control diet. Data related to glycerol's role in helping lactating sows cope with heat stress is currently being evaluated and will be reported in the near future.

Effect of crude glycerol in diets for lactating sows¹

Trait	% Dietary glycerol				PSE
	0	3	6	9	
No. of sows	90	89	85	81	--
Avg. parity	4.5	4.4	4.2	4.2	0.14
Lactation length, d	19.1	18.9	18.8	18.8	0.14
Sow feed intake, kg/d	5.92	6.06 ^a	5.53 ^b	5.83	0.14
Sow wt. loss, kg ²	1.03	2.12	2.81	2.05	1.21
Sow backfat loss, mm ²	1.4	1.5	1.2	1.4	0.18
Litter size weaned	9.4	9.4	9.2	9.2	0.10
Litter weaning wt., kg ²	59.81	58.69	56.55	57.95	0.91
Wean to estrus, d ²	5.5	5.4	5.6	5.2	0.11

¹Schieck, unpublished.

²Lactation length used as covariate in statistical analysis.

^{ab}Means with unlike superscripts differ ($P < 0.06$).

Our initial assessments suggest that crude glycerol is a viable feed ingredient to supply energy to diets for lactating sows. However, special considerations of salt concentrations, methanol content and handling characteristics are necessary to make crude glycerol a practical feed ingredient in commercial pork production systems.