

Growth and Performance of Nursery Pigs Fed Crude Glycerol

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Summary and Implications

The growth and performance of 96 nursery pigs fed crude glycerol was evaluated in a 33 d trial. Pigs were weaned at 21 d of age and had an average start weight of 7.9 ± 1.2 kg (17.4 ± 2.6 lb). Pigs were provided *ad libitum* access to corn soybean diets containing three levels of crude glycerol, 0, 5, or 10%. Diets were formulated to be isocaloric and isolysininc. There was no difference in pig performance based on dietary treatment. Crude glycerol can be fed to young pigs as an energy source without growth or performance effects.

Introduction

Production of biofuels, fuels derived from biodegradable and renewable materials, is increasing due to rising energy prices, uncertain access to petroleum supplies, and recognition of the environmental impacts of using fossil fuels. Biodiesel is a renewable alternative to diesel fuel consisting of the monoalkyl esters formed by a catalyzed reaction of the triacylglycerides in oils or fats with an alcohol. Glycerol is the chief co-product of biodiesel production. Using current refinement processes, every 1.0 L (0.26 gal) of biodiesel produced results in 79 g (0.2 lb) of crude glycerol. Purification of crude glycerol to a chemically pure substance results in a valuable industrial chemical. Widespread processing to that degree may become uneconomical with continued growth in biodiesel production and crude glycerol may become available as

livestock feed. The purpose of this study was to compare growth and performance of young pigs fed crude glycerol.

Materials and Methods

Ninety-six pigs (7.9 ± 1.2 kg or 17.4 ± 2.6 lb) were separated into groups of four based on body weight, gender, and dam. Each group of pigs (31.7 ± 1.7 kg or 69.9 ± 3.7 lb) consisted of two barrows and two gilts that were not littermates. Groups were assigned to 1 of 3 isocaloric and isolysininc diets that contained 0, 5, or 10% glycerol respectively so that no dietary treatment had more than two littermates assigned to it. Each group was randomly assigned to one of 24 nursery pens measuring 1.2×1.2 m.

Pigs received *ad libitum* feed containing 0, 5, or 10% crude glycerol, respectively. Pigs and feeders were weighed weekly and weight of feed presented to the animals was recorded. Pen weight gain, feed efficiency, and average daily gain were calculated for the 33 d trial. Results were analyzed using PROC MIXED of SAS (SAS Inst. Inc., Cary, NC).

Results and Discussion

Growth and performance statistics are reported in table 1. Pen weight gain was not different for the three diets ($P = 0.9$). The feed-to-gain ratio was not different for the three diets ($P = 0.09$). Calculated average daily gain for the average pig on test was normal and did not differ for the three diets ($P > 0.1$). Crude glycerol can be fed to young pigs without altering growth and performance of the animal. This study is the first phase of a wean-to-finish feeding trial that is ongoing. Results for the entire feeding period as well as analysis of carcass traits will be forthcoming.

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Table 1. Effect of crude glycerol on growth and performance of young pigs¹

	Percent Crude Glycerol in Diet						<i>P-value</i>
	0%		5%		10%		
	LS Mean	SE	LS Mean	SE	LS Mean	SE	
Pen weight gain, kg	60.9	1.4	61.2	1.4	60.2	1.4	0.9
Pen feed:gain, kg:kg	1.6	0.02	1.6	0.02	1.6	0.02	0.09
Average daily gain, kg/d	0.46	0.01	0.46	0.01	0.45	0.01	> 0.1

¹Initial body weight 7.9 ± 1.2 kg