

Feeding In-shell Hazelnuts (*Corylus spp*) to Pigs Alters Fatty Acid Profile of Pork Fat

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INTRODUCTION

- Hazelnut (*Corylus spp*) germplasm is being developed for commercial cultivation in upper Midwest of the United States.
- Effectively separating shell and kernel in undersized (<10 mm) hazelnut remains a challenge.
- The purpose of this pilot project was to examine the effects of feeding in-shell hazelnuts to finishing pigs.



In-shell hazelnuts were pulverized to 1772 μm using a roller mill prior to mixing with control diet

METHODS

- Two replicated feeding trials in bedded hoop barns occurred.
- In each replicate, 36 barrows sorted into 6 pens (4.05m²/pig), pens randomly assigned to 1 of 2 dietary treatments. Within replicate, all pigs harvested on same day.
- Dietary Treatments were balanced corn-soybean meal diet (Control) or control diet diluted 90:10 with pulverized in-shell hazelnuts (Hazelnut).
- At harvest: two chops (last rib location, 2.54 cm thick) were collected from each carcass to assess pork quality.
- One cube (2.54 cm³) of fat was removed from half of the chops (1 sample/pig) and analyzed for fatty acid profile.
- The R software (v. 4.0.2) package afex (v. 0.28) was used for statistical analysis by GLM (ADG, ADFI, G:F) or mixed models with subsampling (carcass traits, chop quality, and fatty acids).

SUMMARY

- In-shell hazelnuts contain 21% fat, but fiber concentration may limit practical inclusion rate (table 1).
- Control pigs grew 6% more efficiently, but ADG, ADFI, and carcass characteristics were not impacted by dietary treatment (table 2).
- Fat from pigs fed 10% in-shell hazelnuts had more C18:1 and less C16:0 than control pigs, but other chop characteristics were not impacted by dietary treatment (table 3)



Pork quality attributes were measured (2 chops/pig) pre and post cooking

RESULTS

Table 1. Nutrient profile of <10 mm in-shell hazelnuts¹

Crude protein, %	7.6
Crude fat, %	21.1
Neutral detergent fiber, %	68.7
Acid detergent fiber, %	56.7
Fatty acid profile, % of total fat	
Palmitic, C 16:0	3.8
Oleic, C 18:1	74.9
Linoleic, C 18:2	18.0
Saturated fatty acids	6.2
Unsaturated fatty acids	93.6

¹ Reported on a dry matter basis

Table 2. Growth performance and carcass characteristics of pigs

	Dietary Treatment ¹			
	Control	Hazelnut	SEM	P-value
Start wt, kg	58.20	58.00	0.73	0.86
End wt, kg	130.00	129.00	1.40	0.44
ADG, kg/d	1.06	1.04	0.02	0.37
ADFI, kg/d	3.74	3.90	0.06	0.36
G:F, g:kg	284.00	267.00	0.00	0.03
Hot carcass wt, kg	216.00	217.00	3.53	0.79
Fat depth, last rib	3.43	3.30	0.10	0.41

¹ Control = corn-soybean meal diet; Hazelnut = 90:10 control diet: pulverized in-shell hazelnut

Table 3. Loin chop quality and fatty acid profile of pork fat

	Dietary Treatment ¹			
	Control	Hazelnut	SEM	P-value
Marbling	1.80	1.71	0.90	0.70
pH	5.75	5.78	0.02	0.17
Color	3.01	3.01	0.04	0.93
Palmitic C16:0	25.60	24.60	0.25	0.01
Oleic C18:1	41.00	43.30	0.47	< 0.01
SFA	42.00	39.80	0.55	< 0.01
MUFA	45.40	47.50	0.49	0.01

¹ Control = corn-soybean meal diet; Hazelnut = 90:10 control diet:pulverized in-shell hazelnut