



# Growth, performance, and carcass quality of hazelnut supplemented finishing pigs

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# Hazelnuts...

- Perennial shrub
- Cultivated germplasm available
- <https://www.midwesthazelnuts.org/>





- Processing hazelnut remains a challenge for Midwest growers
- Undersized (<10 mm)
- Incomplete separation



# Hazelnut vs Soybean

	<b>&lt; 10 mm, whole nut</b>	<b>Kernels</b>	<b>Whole soybean</b>
Crude Protein, % DM	7.56	18.42	39.60
Lysine, % DM	0.24	0.52	6.20
Methionine, % DM	0.10	0.23	1.40
Crude Fat, % DM	21.11	61.22	21.00
Linoleic, % of total fatty acids	3.58	9.40	51.00
Oleic, % of total fatty acids	14.87	45.36	23.00

# Nutrient Profile of Hazelnut products

<b>Nutrient, % as fed</b>	<b>&lt; 10 mm whole nut</b>	<b>Corn grain</b>	<b>Soybean meal</b>	<b>Hazelnut Kernels</b>
Water	6.02	11.00	10.00	3.88
Crude Protein	7.11	8.30	47.50	17.71
Crude Fat	19.84	3.90	3.00	58.85
Crude Fiber	46.48	2.30	3.40	4.63

# Hazelnut Fed Pigs

- 36 barrows, 6 pens of 6
- Start weight 135 lb
- All pigs marketed 69 days later
- Corn soybean meal  $\pm$  10% in shell hazelnut (<10 mm)



# Preparing Hazelnuts

- Small scale roller mill
- 2 hp... 60 bu barley/hr
- Designed for homebrewers



# Trial and error... 15 min = 200 lb

- 2 passes
- 1772 microns







# Feed particle size

- Impacts digestibility of pig feed
- Milled hazelnuts = 1772  $\mu\text{m}$
- Corn-Soy Diet = 800  $\mu\text{m}$
- Corn-Soy + 10% Hazelnut = 991  $\mu\text{m}$

- Weigh every 4 weeks
- Digital ultrasound at start and end
- Carcasses evaluated
- 2 chops/pig collected



# Growth and Performance

## Summer Trial (6/4-8/12)

	<b>Control</b>	<b>10% Hazelnut</b>	<b>SEM</b>	<b>P-value</b>
<b>Start wt, lb</b>	135.6	135.0	1.7	0.8238
<b>End wt, lb</b>	281.2	275.2	5.6	0.4942
<b>ADG, lb/d</b>	2.11	2.02	0.07	0.4547
<b>ADFI, lb/d</b>	7.57	7.83	0.22	0.4633
<b>G:F</b>	0.278	0.260	0.005	0.0661



# Carcass and Meat Quality

- Carcasses evaluated at harvest
- 2 chops/pig collected
- Analysis on-going
- Preliminary results from Summer Trial



# Carcass and meat quality (SUMMER)

- No difference in hot carcass, % lean, marbling, loin eye area
- No difference in color, tenderness, water holding capacity
- No difference in taste panel results

# Fatty Acid Profile was impacted (SUMMER)

	<b>Control</b>	<b>10% Hazelnut</b>	<b>SEM</b>	<b>P-value</b>
<b>Palmitic (16:0)</b>	25.86	24.60	0.32	0.0194
<b>Oleic (18:1)</b>	40.32	42.71	0.50	0.0294



# Summary

- Growth and performance similar
- Oleic acid concentration was ~6% higher when pigs fed 10% in-shell hazelnuts (summer 2019 data)
- No discernable quality differences detected




# Stay Tuned...

- Trial 1 complete
- Trial 2 feeding trial complete, analysis continues
- Complete results available summer 2020

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# Thank you to Collaborators

- Krista Eiseman, UW-Platteville
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- Jason Fischbach, UW-Extension
- Brad Niemcek, American Hazelnut Company
- Jim Magolski, Niman Ranch



# Acorn Fed Pigs

- Southern Spain
- 100% Jamon Iberico de bellota
- Ham from purebred Iberian
- pigs fed acorns



# Production Basics

- 1.5–2 years birth to harvest
- 3 year-long traditional curing process
- Iberian Ham = pig from Spain
- Labeling matters.....

These pigs are not the same!



# Traditional Iberian

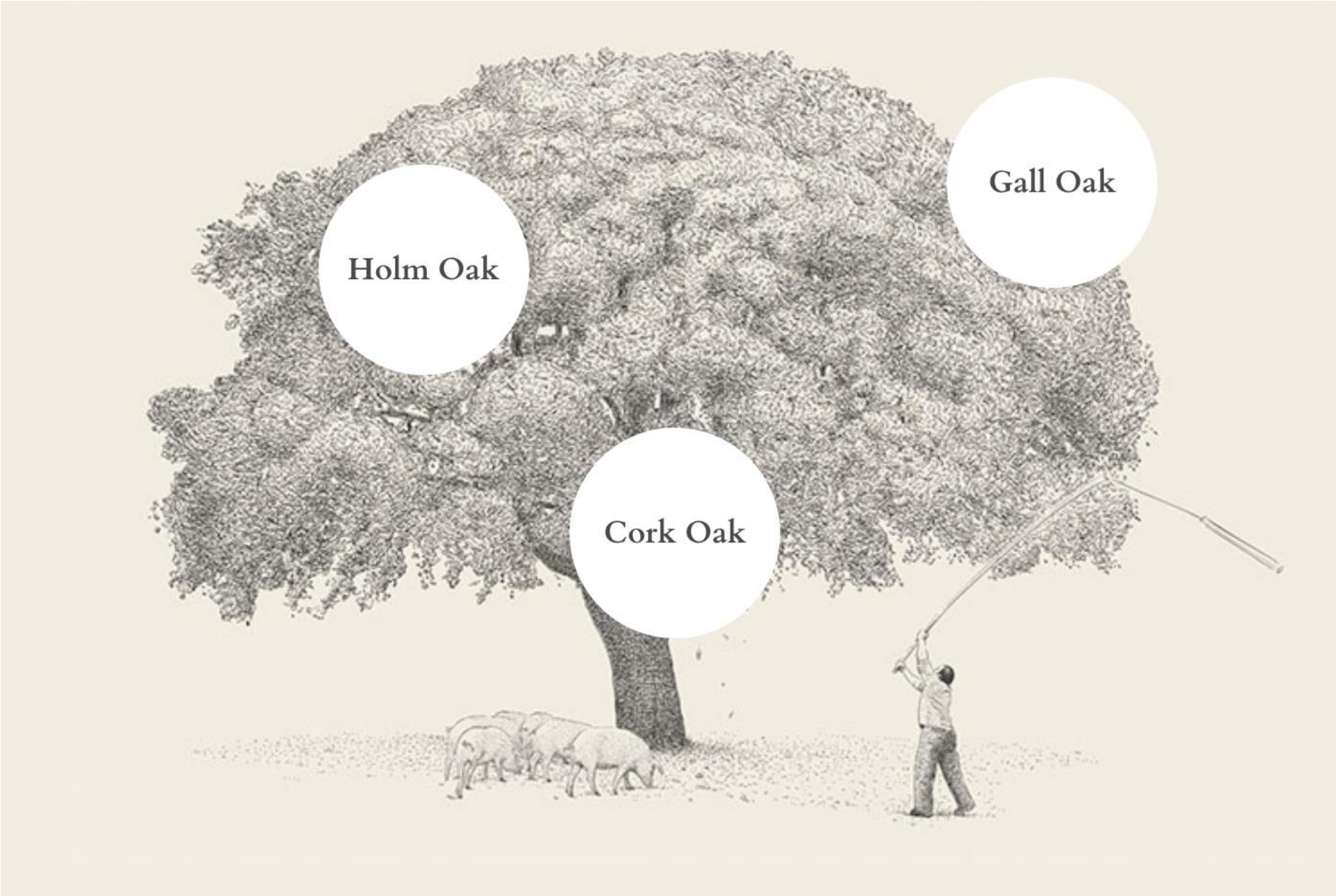
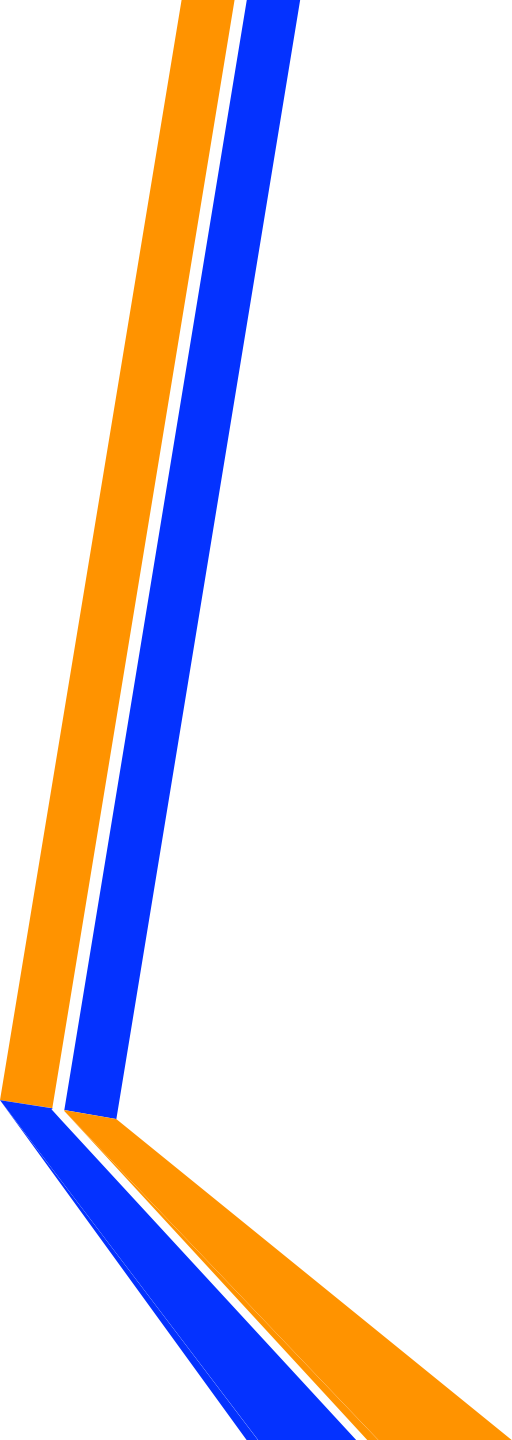
- Long snout
- Long legs
- Thin muscle
- “walking olive tree”





# Acorns... available for 3-4 months

- Iberian pigs evolved to grow lots of fat when acorns present
- Slow growing (but survive) until acorns return





# Acorn Fed Pigs in Spain...

- 10-12 months of corn-soy until 200 lb
- Put onto acorn pasture for 3-4 months
- 7.4-14.8 acres/pig
- Eat about 10 lb acorn/d
- Grow at about 2 lb/d



# The ham is amazing!

- \$48/lb online



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# Acorn vs Hazelnut...

- Both are rich in oleic acid
- Potentially unique pork flavor profile
- The hull is a challenge