

**Novel Nutritional Approach to Rearing
Organic Pastured Broiler Chickens**

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http://www.extension.org/organic_production





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**A novel nutritional approach to rearing
organic pastured broilers**

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Our team:

- OSU:
 - Dr. Mike Lilburn Poultry Nutritionist
 - Dr. Larry Phelan Soil communities/Plant Health
 - Dr. Marve Batte Economist
 - John Anderson OSU staff, Animal Sciences
 - Kathy Bielek OSU staff, Organic Program
- College of Wooster:
 - Dr. Matthew Mariola Environmental Studies
- 3 Organic producers
- A small state inspected poultry processor catering to pastured/organic producers.

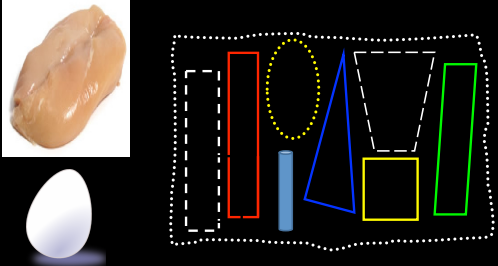
Organic Poultry (Crandall et al., 2009)

- Organic foods represent 3% of total retail food sales (\$ 17 billion) and organic meat is the fastest growing sector of the organic market
- Bimodal distribution, 20's and aging baby boomers
- Traditional preference for local producers, safer than conventional poultry
- Organic poultry diets = \$\$\$\$\$

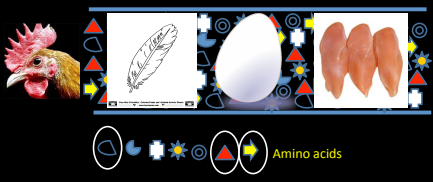




Poultry meat and eggs are composed of multiple individual proteins



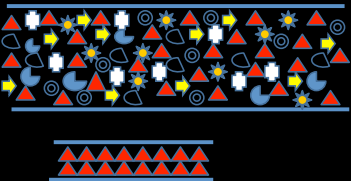
Individual proteins have unique patterns of amino acids some of which are dietary essential.



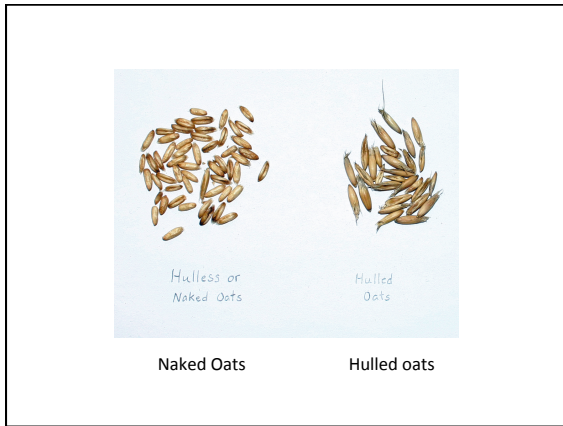
Less essential amino acids = less feathers, eggs, muscle

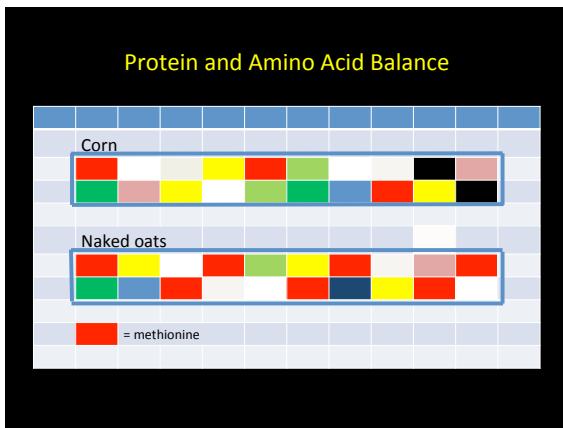
Methionine - the single most important essential amino acid

Soybean meal



Synthetic methionine





Oat/corn comparison

Nutrient	Ohio Naked Oats 1	Ohio Naked Oats 2	# 2 Corn
Crude Protein	12.1	12.3	8.0
Fat	4.24	4.71	2.9
Fiber	2.45	2.48	----
Lysine	0.55	0.53	0.26
Methionine	0.20	0.21	0.18
Meth + Cyst	0.50	0.51	0.35

Organic Poultry Diets – Naked Oats



"Although still formulating a final ration based mainly on home-grown grains, initial costings show that the naked oat inclusion has saved £80-£100/t compared with her bought-in organic layers ration."

Nantclyd Organics
Aberystwyth, UK (2011)

Organic Rotation

Plot 1	Plot 2	Plot 3
<u>Year 1</u> Clover / Poultry (cover crop, 1 st cut hay)	Spelt / Tillage Radish	Naked Oats / Clover
<u>Year 2</u> Spelt / Tillage Radish (grain, straw)	Naked Oats / Clover	Clover / Poultry
<u>Year 3</u> Naked Oats / Clover (feed, granola)	Clover / Poultry	Spelt / Tillage Radish

The crop rotation - three fields

1. Poultry and clover until Sept.
Then fall seed (late Sept) to Spelt.
2. Harvest Spelt July of next year.
Plant tillage radish for cover crop
3. Tillage radish holds nutrients and winter kills. Plant oats in the spring, harvest oats July or early August. Follow oats with clover in August.

Organic Poultry



Organic Poultry quality of product, not how fast it grows.....

6-7 wks



Corn, Soy



7-8 + wks



Alternative



Commercial and RedBro Broiler



Preliminary Naked Oats Experiment
(all birds were fed a similar starter diet from 0 to 3 weeks)

	Corn (65%) Soy (28 %)	NO (65 %) FF-Soy (31.6 %)	NO (85 %) FF-Soy (10 %)
Dietary CP	19.0	19.4	13.6
Carcass Wt.	4.82	4.97	4.99
Carcass CP	52.3	46.0	45.7
Carcass DM(%)	34.2	36.0	36.3
Drip Loss (%) 24 hr	1.79	3.34	3.74
Breast DM(%)	27.6	27.5	26.6

Preliminary Experiment

Nutrient	65% NO/31.6% FFsoy	75% NO/20.6% FFsoy	85% NO/10% FFsoy
Crude Protein	19.4	16.4	13.5
Fat	8.6	8.0	7.3
Lysine	1.10	0.90	0.7
Methionine **	0.30	0.26	0.22
Meth+Cyst	0.66	0.60	0.53
Ca	0.9	0.90	0.75

** No synthetic methionine was added to any diets.

Pastured poultry producers are usually not trying to maximize growth, so it may not be necessary to feed a diet with optimal amino acid ratios.

2012 - First group placed on pasture at 3 weeks old (June 13).



- Shelters were moved 1x a day.
- Birds were fed *ad libitum*.
- Diet = 75% naked oats/
20% FF soybeans



2012 Performance

	Age (Days)	BW (lbs)	Carcass Wt (lbs)	Dressing %
1 st Flock Broiler	51	5.63	4.04	71.8
1 st Flock RedBro	65	6.34	4.18	65.9
2 nd Flock Broiler	54	6.26	4.43	70.8
2 nd Flock RedBro	62	4.98	3.24	65

Seasonal Variability - 2012

Grow	Strain	Dates			Days	Dress Weight	Dress %
1	White	Start *	Move	Finish	51	4.04	71.8
	RedBro				65	4.18	65.9
2	White	July	August	Sept	54	4.43	70.8
	RedBro				62	3.24	65.0

All chicks were fed a commercial organic starter diet from 0-3 wks.



Carcass Weight and Cook Loss - 2012

Strain	Weight Group	Carcass Weight	Carcass DM %	Cook Loss % *
White	Heavy	4.78	41.9	30.1
	Medium	4.22	38.7	28.4
	Light	3.58	39.5 (40.0)	30.7 (29.8)
RedBro	Heavy	4.85	51.8	29.1
	Medium	4.15	46.9	28.4
	Light	3.58	50.8 (49.8)	27.5 (28.3)

* Chicken halves cooked to a constant temperature of 160° F



Carcass Composition - 2012

Strain	Weight Group	% Total Breast	% Thigh	% Drum
White	Heavy	25.9	18.8	13.6
	Medium	25.3	17.3	14.0
	Light	22.8 (24.6)	18.0 (18.0)	14.7 (14.2)
RedBro	Heavy	16.4	18.6	16.0
	Medium	20.4	18.6	15.5
	Light	19.8 (19.0)	20.4 (19.2)	14.6 (15.4)



2 ft² per bird with one move per day caused some stand loss in the clover.



2013 Performance

	Age (Days)	BW (lbs)	Carcass wt (lbs)	Dressing %
1 st Flock Broiler	53	7.51	5.17	69
1 st Flock RedBros	66	7.07	4.81	68
2 nd Flock Broiler	48	4.95	3.20	62
2 nd Flock RedBros	48	3.90	2.50	60.3

Good pasture at co-operators farm





Oat variety trial



Oat variety trial



Naked Oats Variety Trial

Variety	2012 bu/ acre	2013 bu/ acre
Streaker	48.4	46
Buff	47.9	46
Paul	35	43
Excel (hulled)*	53.6	44

- Adjusted for hull
- In 2013, Streaker had significant lodging problems.

THANK YOU !!!

Organic Research and Extension Initiative (OREI)

A WHOLE FARM APPROACH TO INCORPORATING PASTURE
RAISED ORGANIC POULTRY AND A NOVEL CEREAL GRAIN
(NAKED OATS) INTO A MULTI-YEAR ORGANIC ROTATION

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