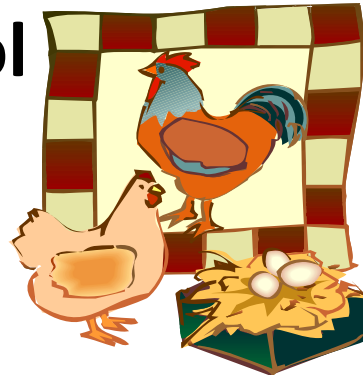


Livestock & Poultry Pennsylvania



Poultry and the National Air Quality Site Assessment Tool

Paul Patterson
Professor of
Poultry Science



Penn State Extension

Broiler Production (2013)



State	No. (1,000 hd)	Lbs. (1,000)	US Rank
Maryland	305,200	1,617,600	8 th
Pennsylvania	168,800	945,300	15 th
Other states	552,000	3,220,600	---
Total US	8,524,800	49,008,600	---



Livestock & Poultry

Pennsylvania



Turkey Production (2013)



State	No. (1,000 hd)	Lbs. (1,000)	US Rank
Pennsylvania	7,000	170,800	9 th
Other States	35,100	1,218,600	---
Total US	240,000	7,276,800	



Egg Production (2013)



State	Hens in Flks < 30,000 (1,000)	All Hens (1,000)	No. Eggs (million)	Rank
Maryland	118	2,696	673	26 th
Pennsylvania	1,220	25,581	7,365	4 th
New York	220	4,798	1,333	16 th
Other states	8,151	21,015	2,368	---
Total US	60,742	360,530	95,176	---



Livestock & Poultry

Pennsylvania



PA Embryo Industry

- Health and Human Services
Homeland Security



- 4 companies produce fertile eggs & incubate 11-d embryos for the human influenza market
- Approx. 1.65 mill laying hens
- Est. 28-30 farms, 30-40,000 hens/house



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PA Game Bird Industry

*Propagators & shooting
preserves licensed/regulated
by PGC (n=522)*



Species	Eggs Sold	Chicks Sold	Birds Sold	Birds Released
Pheasant	425,000	442,000	504,000	377,000
Bobwhite Quail	29,000	1,000,000	230,000	65,000
Chukar Partridge	252,000	633,000	152,000	84,000
Hungarian Partridge	190	374	109,000	1600



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PA Live Bird Market System

- 276 flocks on PA AI Monitored flock program
- 16 dealers, 3 haulers, 9 LBM, 17 auctions



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Layer Farm Expansion



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Livestock & Poultry

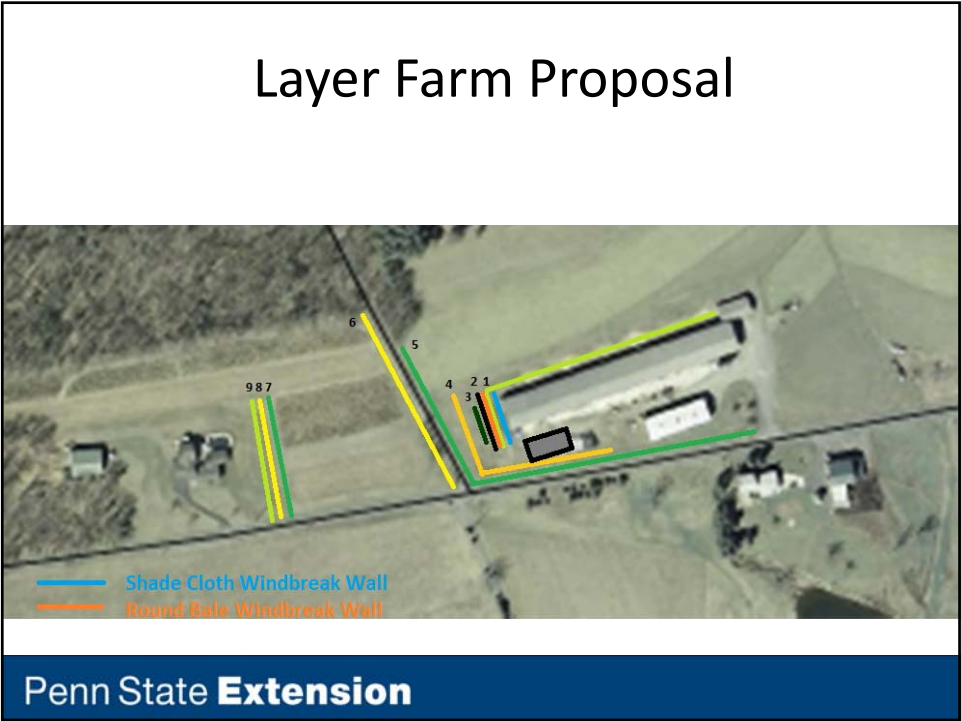
Pennsylvania



Before

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH ₃)	Hydrogen sulfide (H ₂ S)	Methane (CH ₄)	Volatile organic compounds (VOCs)	Nitrous Oxide (N ₂ O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer							N/A
Manure Storage							
Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads	N/A						
Perception			N/A	N/A	N/A	N/A	N/A

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Livestock & Poultry

Pennsylvania



After Veg Buffer & Windbreak Walls

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH ₃)	Hydrogen sulfide (H ₂ S)	Methane (CH ₄)	Volatile organic compounds (VOCs)	Nitrous Oxide (N ₂ O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer							N/A
Manure Storage							
Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads	N/A						
Perception			N/A	N/A	N/A	N/A	N/A

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Layer Farm



Penn State **Extension**

Livestock & Poultry

Pennsylvania



Layer Farm



Penn State **Extension**



Penn

Livestock & Poultry

Pennsylvania



Before

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH ₃)	Hydrogen sulfide (H ₂ S)	Methane (CH ₄)	Volatile organic compounds (VOCs)	Nitrous Oxide (N ₂ O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer							N/A
Manure Storage							
Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads	N/A						
Perception			N/A	N/A	N/A	N/A	N/A

Penn State Extension

Turkey Farm




Penn State Extension

Livestock & Poultry

Pennsylvania



Turkey Farm



Penn State **Extension**

After Vegetative Buffers

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH ₃)	Hydrogen sulfide (H ₂ S)	Methane (CH ₄)	Volatile organic compounds (VOCs)	Nitrous Oxide (N ₂ O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer							N/A
Manure Storage							
Land Application							N/A
Mortalities		N/A					N/A
On-farm Roads	N/A						
Perception			N/A	N/A	N/A	N/A	N/A

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Turkey/Broiler Farm



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- Before
- Litter storage
- Litter composting

Management Category	Odor	Particulate Matter (Dust)	Ammonia (NH ₃)	Hydrogen sulfide (H ₂ S)	Methane (CH ₄)	Volatile organic compounds (VOCs)	Nitrous Oxide (N ₂ O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer				N/A	N/A	N/A	N/A
Manure Storage							
Land Application	N/A						
Mortalities		N/A					N/A
On-farm Roads				N/A	N/A		N/A
Perception			N/A	N/A	N/A	N/A	N/A

- After
- Litter incineration

	Odor	Particulate Matter	Ammonia	Hydrogen sulfide	Methane	Volatile organic compounds (VOCs)	Nitrous Oxide (N ₂ O)
Animals and Housing				N/A	N/A	N/A	N/A
Feed and Water		N/A		N/A	N/A	N/A	N/A
Collection and Transfer				N/A	N/A	N/A	N/A
Manure Storage							
Land Application	N/A						
Mortalities		N/A					N/A
On-farm Roads				N/A	N/A		N/A
Perception			N/A	N/A	N/A	N/A	N/A

Animals and Housing

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[illegible]

- **Before**
- Litter incineration

- After
- Veg Buffer

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Livestock & Poultry

Pennsylvania



Summary

- Animals & Housing:
 - Animals: continuously improving gain, efficiency & mortality
 - Housing: type continuous evolution, improvement & mitigation strategies w/ housing (technologies)
- Feed & Water:
 - Dietary strategies – fully implemented & evolving
- Collection & Transfer: clean out & single/multiple cycles on litter

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Summary

- Manure Storage: dry systems mostly w/ continuous evolution & improvements e.g. composting, pellet, gasification, incineration
- Mortalities: there are options
- Perception: clean facility & veg buffers opportunities

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