

History of the Dendy Lecture, IPSF, IPPE, and the US Broiler Industry

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Dendy Keynote Lecture Series

Milton Dendy was born on May 17, 1915, in Alabama. Milton grew up on the family farm and died at 102 in Athens, Georgia. He received his B.S. in Poultry Science in 1949 and Master's in Agriculture in 1950. He began a series of jobs before accepting a position as an Extension Specialist at the University of Georgia from 1955-1977.

Mr. Dendy served as the first Secretary/Treasurer of SPSS until 1992. In 1998, SPSS and SCAD met together, and the Dendy Lecture was created. SCAD took over funding of the lecture with organizational help of the USPE+A.

Early lectures are archived on the SPSS website.

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Southern Poultry Science Society



The Association of Southern Agricultural Workers started in 1931 as part of the PSA. The Society was established to bring persons interested in poultry science through research and education.

In 1980, the Poultry Section of the Association of Southern Ag Workers broke off from that group with the leadership of Dr. E.L. Stephenson and Dr. Bob Harms formed the Southern Poultry Science Society (SPSS).

The first SPSS and SCAD combined meeting was held in 1988 at the nearby Hotel through the work of Drs. Gene Pesti and John Glisson. In the 1990s the USPE+A (formerly the SEPE+A) invited the societies to meet before the opening of the Expo. The combined conference became the International Poultry Scientific Form (IPSF).

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Southern Conference on Avian Diseases



The SCAD provides a meeting to stimulate research and encourage veterinary and graduate student training in avian diseases.

The first meeting was in 1962. The meeting provided yearly Poultry Disease Reports from 50 Diagnostic Laboratories to the American Association of Avian Pathology (AAAP). The group meet in June prior to the AAAP annual meeting.

In the early 1970s the group meet for a formal scientific meeting during spring break with the Southern Animal Disease Research Workers at various Veterinary Medical Schools until combining with the SPSS.

The Meeting was slowly transformed from mainly Professor's research to mainly graduate student presentations and posters with international scientists. Dr. C. S. Edison student awards are now given prior to the Dendy lecture.

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The History of the US Broiler Industry

- Chickens were brought to the US by European Settlers during Colonial America
- 1700's – early 1900's:
Backyard birds were the rule
- Dual purpose chickens (eggs and meat) were raised alongside other animals like cows, pigs, and crops.
- Raised on family farms for their own use, local bartering, and/or selling.



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The History of the US Broiler Industry



- **1923: Cecilia (Wilmer) Steele of Sussex County, DE**
 - Credited as the pioneer of broiler industry
 - Ordered 50, got 500 chickens
 - 1926 – 10,000 chickens housed in one location



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The History of the US Broiler Industry

- 1920's – 30's: "broiler" industry developed
 - Delmarva + New England
 - Favorable weather+ access to feedstuffs and large populations
 - Land had been used for farming for several centuries

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The History of the US Broiler Industry



- **1931 – John W. Tyson (1905-1967) began selling chickens in Arkansas**
 - **WWII – chicken is one of the few foods were not rationed**
 - **Builds hatchery and feed mill**
 - **1947 – J.T. incorporates Tyson Feed and Hatchery**
 - **Provides 3 basic services – chicks, feed, transportation to market**
 - **1958 – builds first integrated processing plant, goes public**
 - **1967- 2011 Don Tyson. Tyson becomes largest domestic poultry company, organizes internationally , and 5th largest food company in US**
 - **2011-2021 John Tyson**
 - **2021 Donny King CEO**
- Dennis Brothers*

First Poultry Exposition in Atlanta



The first show was in January 1951 in Atlanta when 67 firms exhibited and 2000 people attended. The Southeastern Poultry and Egg Association (SEP+A) exposition now in the Georgia Congress Center steadily grew to become the USPE+A Expo and finally the IPPE encompassing red meat processing.

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➤ **1936 – D.W. Brooks (1901-1999) – started a Georgia farmers cooperative – became Cotton Producers Association**

- Became Gold Kist Inc.
- Retail stores selling feed, fertilizer,.....chicks
- Member growers wanted a better way to market their birds
- Became the second largest poultry company
- 2005 – Sold to Pilgrim's Pride

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The National Broiler Council formed in 1954 advocates for the companies that raise and process broiler chickens. It is now called The National Chicken Council



These leaders of the broiler industry met in Washington, D. C., in June of last year, elected officers, and adopted bylaws for the National Broiler Council. They are, left to right, standing: Charles Vantress, Duluth, Ga.; Clyde Hendrix, Clinton, Iowa; Ray Firestone, Troutville, Va.; J. D. Jewell, Gainesville, Ga.; Otis Esham, Parsonsburg, Md.; Roy Ritter, Springdale, Ark. Left to right, seated: J. D. Sykes, St. Louis, Mo.; Lucien Jones, Lafayette, Ind.; B. C. Rogers, Morton, Miss.; Jerry Henshaw, Dallas, Tex.; Marshall Durbin, Birmingham, Ala.; Ray Purnell, Tupelo, Miss.; Henry Saglio, Glasgobury, Conn.; E. S. Kendrick, N. Wilkesboro, N. C.; Clyde Fore, Siler City, N. C. Not shown: H. C. Kennett, Durham, N. C.; W. R. Shaffer, Maurertown, Va.; Henry Tilford, Jr., Shelbyville, Tenn.; Frank Frazier, Richmond, Va.

NATIONAL CHICKEN COUNCIL

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The US Poultry and Egg Association was formed in 1994.

The organization started an initiative in 1994 for funding the recruitment of students to poultry science departments, and later other universities with poultry programs.

The USPOULTRY Foundation College Student Career Program brings 600+ students to IPPE for providing them with the opportunity to connect and interview for jobs and internships.

The organization also provides funding to support research since 1969 to help solve a variety of industry needs. To date 90 million dollars has been awarded with 3 million last year.

The organization sponsors meetings to support aspects of poultry production as well as the IPSF and IPPE.

IPPE sponsored by The USPE+A is the world's largest poultry, egg, meat and animal food industry event. The 2025 IPPE will have 1,900+ exhibitors and nearly 33,000 attendees.



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[IPPE mobile app](#)

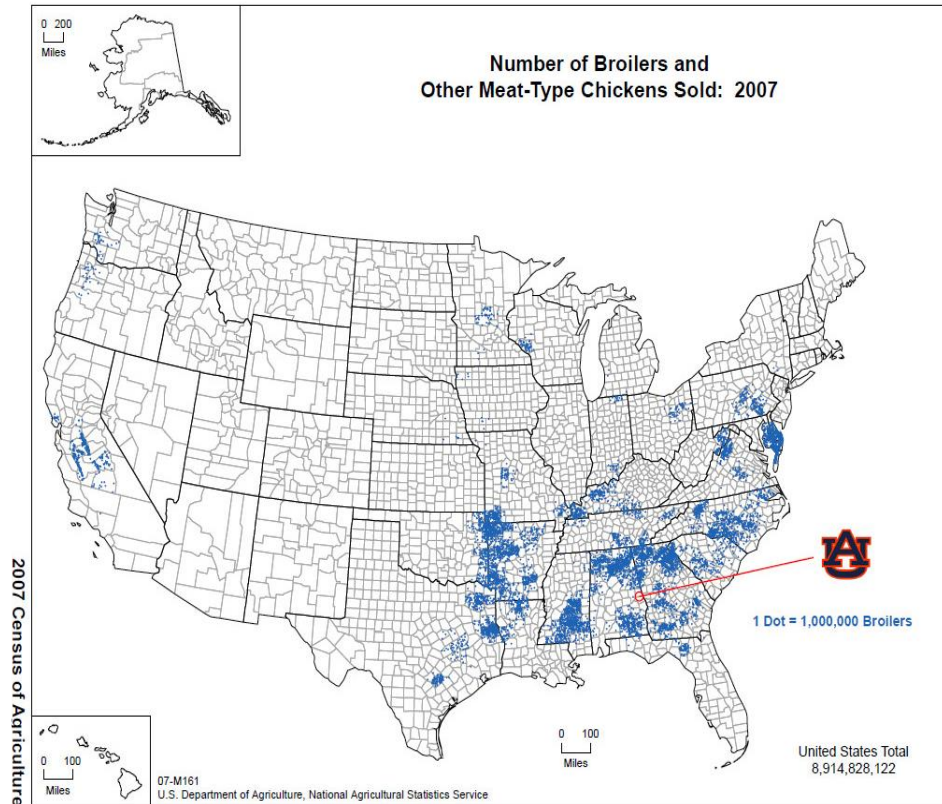
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Innovation - “The Chicken of Tomorrow”

- Poultry retailers held a contest to develop a higher yield meat chicken
- National contest in June 1948
 - 40 participants
 - 720 hatching eggs
 - Hatchability winner 87%
 - 400 chicks - 12 weeks growing period
 - FCR winner – 3.17
 - Average live weight winner – 3.57 lbs
- Goal: broader-breasts, bigger drumsticks, plumper thighs, and more white meat
- Some of the champions became the major genetics suppliers of today's industry
- *Wilmer Pacheco*



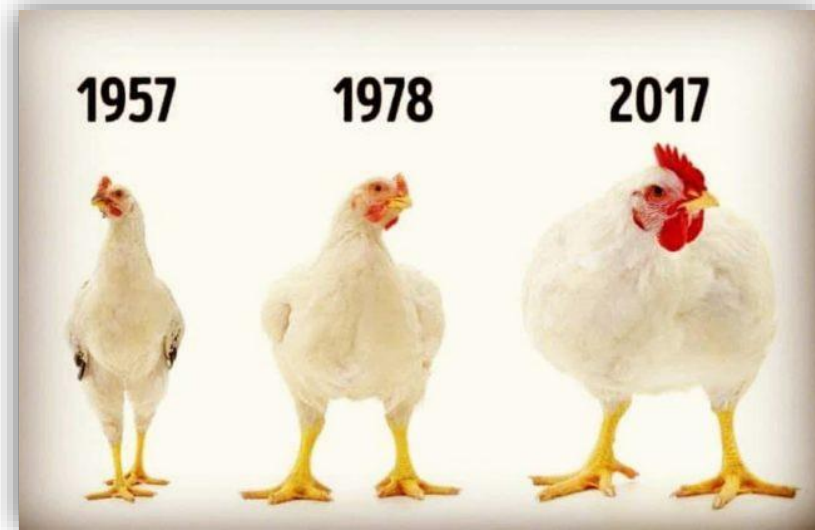
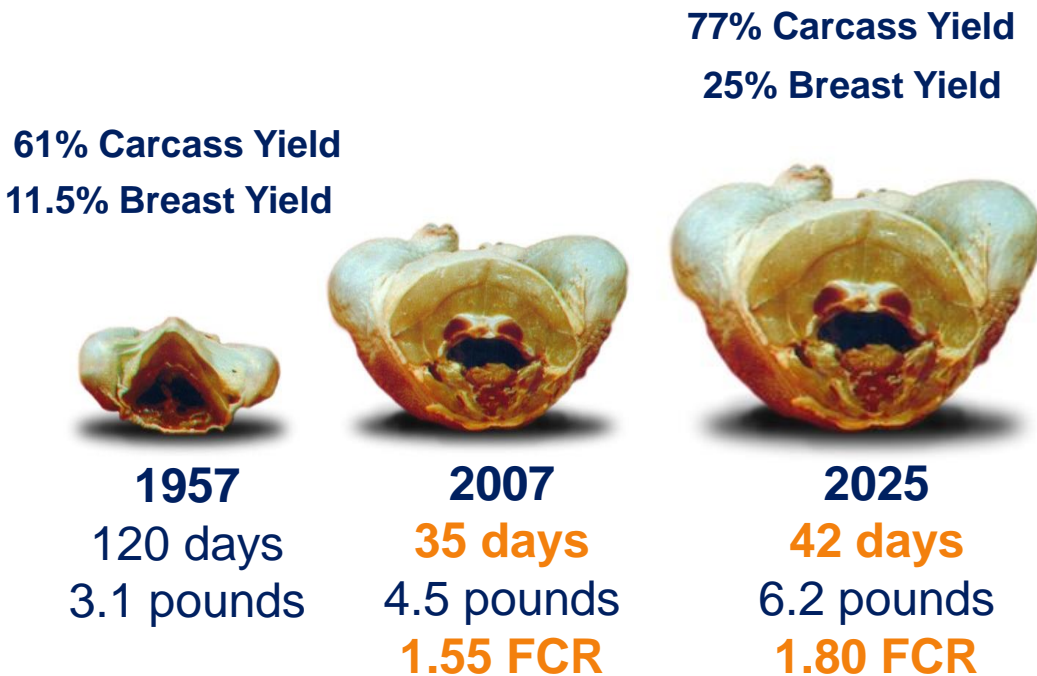
Major US Broiler Production Relocates



- More favorable weather and readily access to feedstuffs through river barges and rails.
- Large amounts of inexpensive land and labor on land less suitable for row crops.
- Top broiler producers Tyson, Pilgrims, Purdue, Wayne Sanderson.

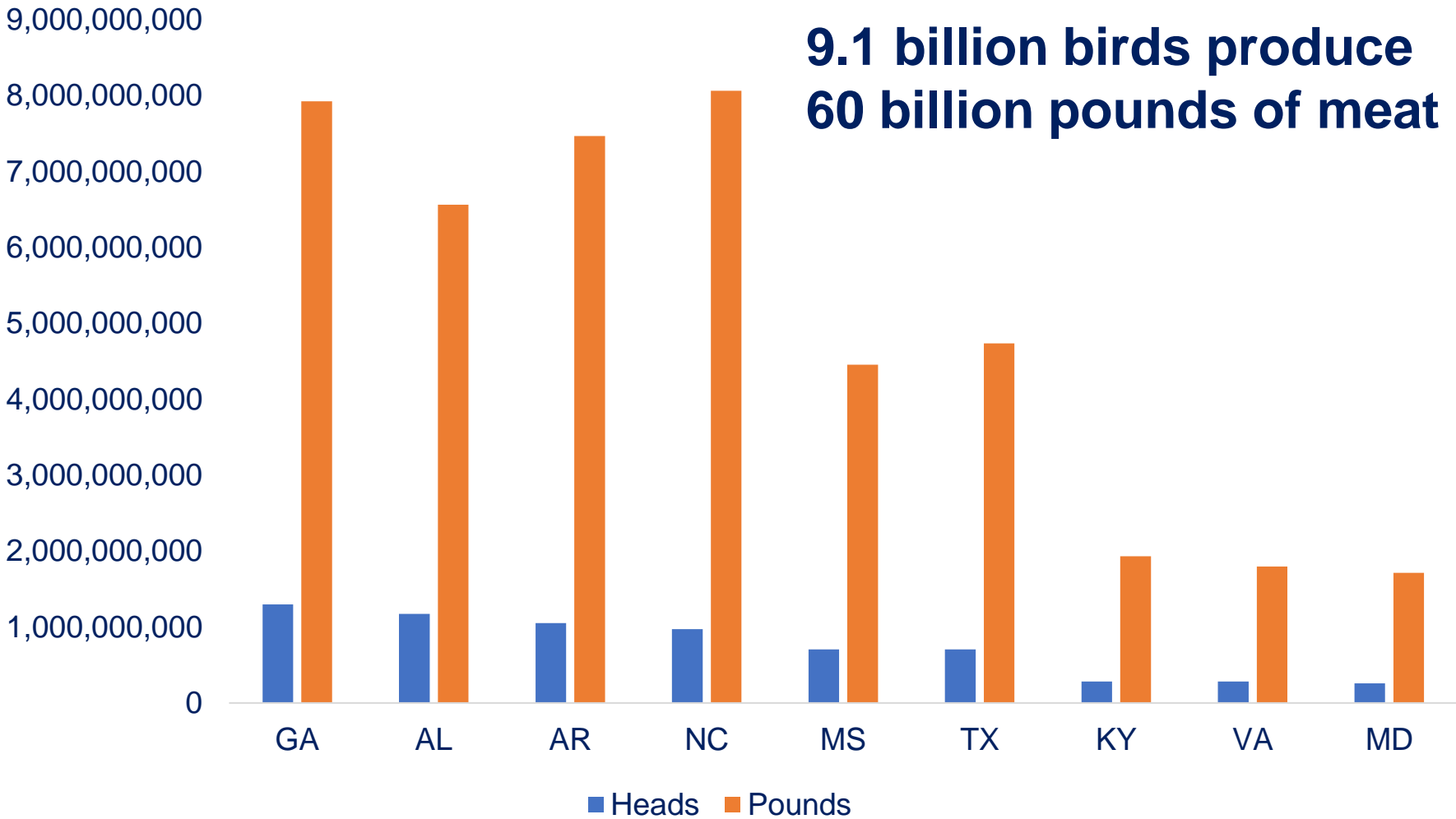
Genetic Improvement

- Improvements in genetic selection have allowed broilers to:
 - Grow at a steady pace
 - Reach the market weight in shorter time



Ross 708 Male Performance Objectives

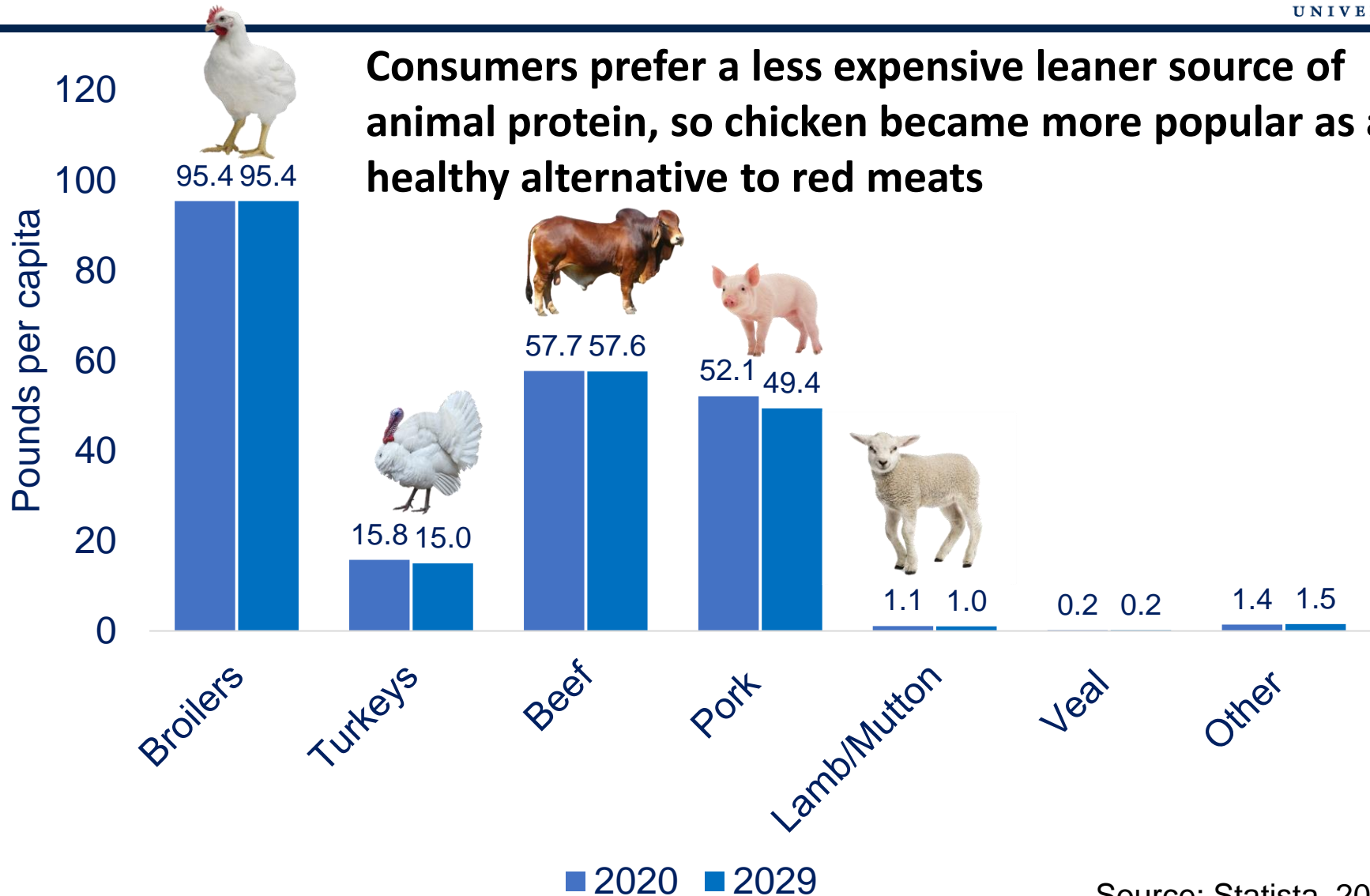
Broiler Production in the United States



Wilmer Pacheco

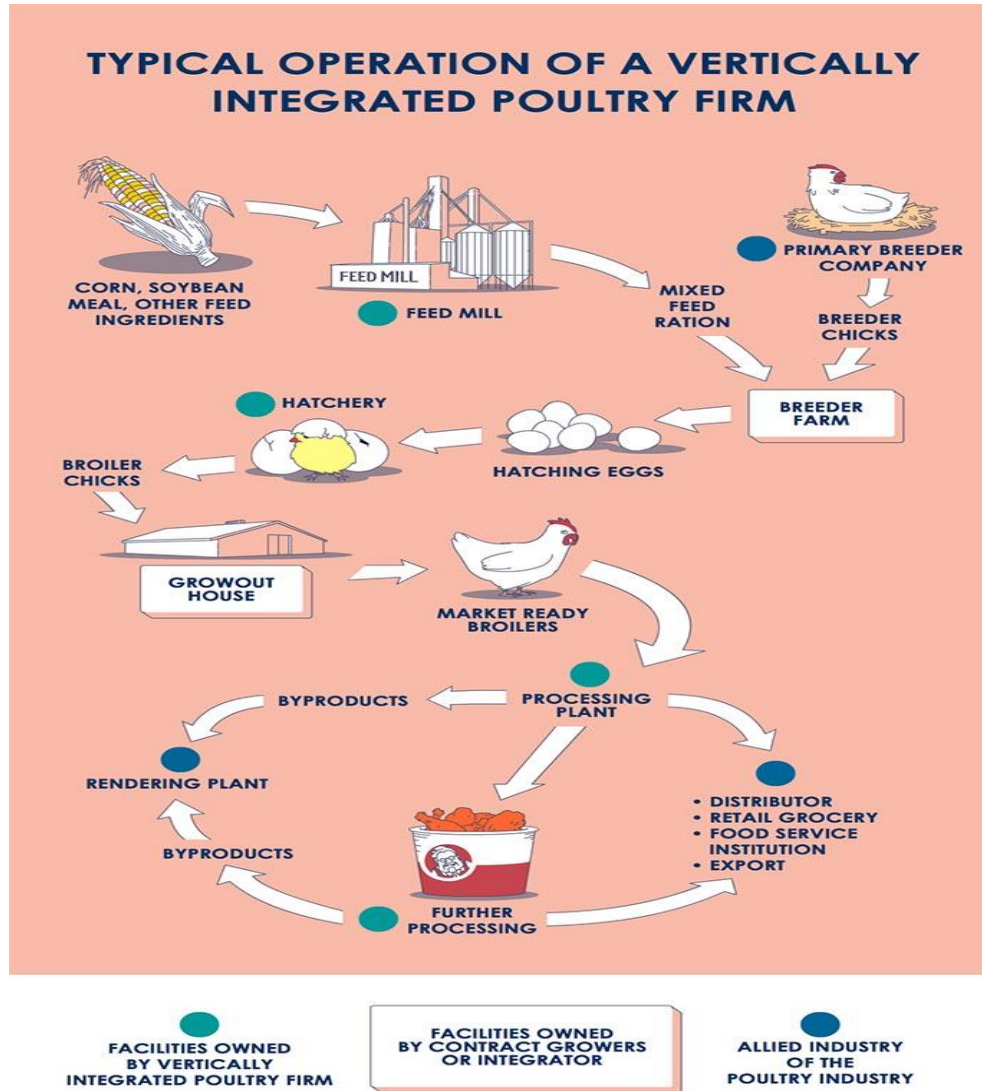
Per Capita Meat Consumption in the US

Consumers prefer a less expensive leaner source of animal protein, so chicken became more popular as a healthy alternative to red meats



Source: Statista, 2020

Vertically Integrated Companies



Vertically Integrated Companies

Broiler, Pullet, and Breeder Growers

Own the real estate

Own the housing

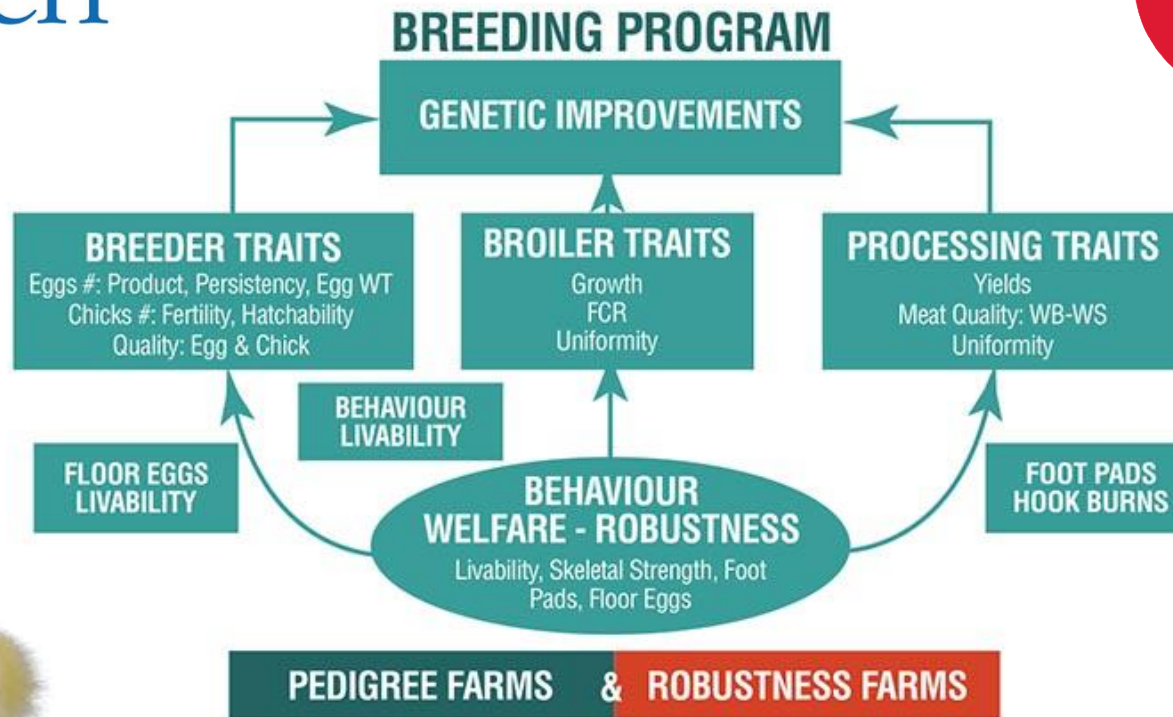
Responsible for all utility costs,
litter costs, mortality disposal costs

DO NOT own the birds or the feed

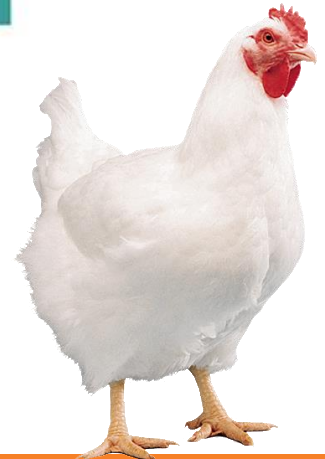
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Primary Breeders



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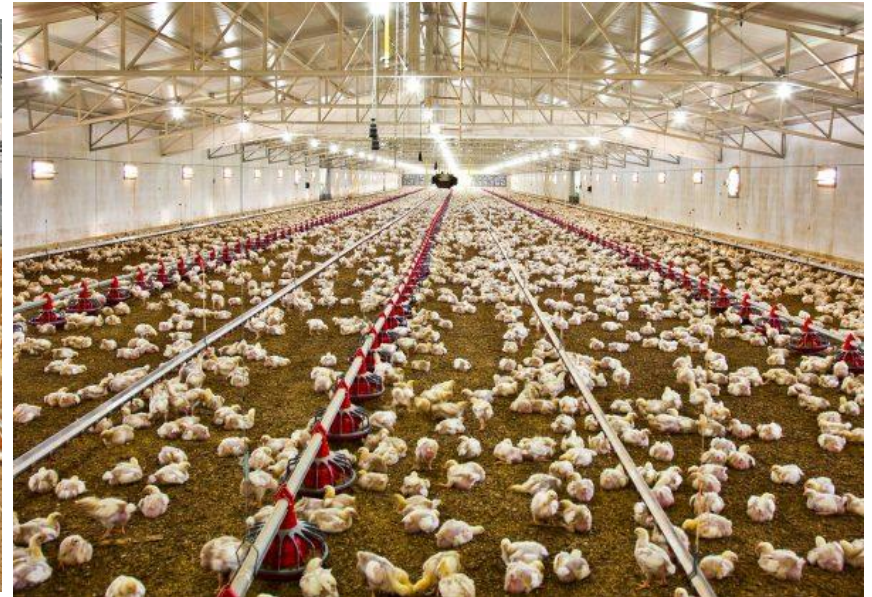
Typical Broiler Farm in the United States



Small space requirement, short growing time, and short generation interval make chickens easier to integrate than other animal farming companies. 233,770 poultry farms in the U.S. annually produced 9.1 billion per year.

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Typical Broiler House Interiors



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Advances in Poultry Health

Vineland Poultry Laboratories (Vipol) makes pox vaccine – 1925

S. Pullorum and Paratyphimurium Ags – 1928 for Salmonella detection

Sulphur, Penicillium, Tetracycline, Arsenicals, flavo, oro, and neomycins, bacitracin antibiotics for the prevention and treatment of diseases and growth promotion.

New vaccines (live attenuated in embryos and cell culture and inactivated) were developed in small dose (1,000) vials which lacked mass application

1948 – first anti-cocci feed additive introduced for feed usage

1970's Anti-cocci ionophors and Coccivac

Announcing . . .

VIPOL 717

INTRAMUSCULAR

A NEW, MILD STRAIN of VACCINE for the IMMUNIZATION of POULTRY against NEWCASTLE DISEASE!

*** SCIENTIFICALLY TESTED IN THE LABORATORY!
* PROVEN ON MORE THAN 4 MILLION BIRDS IN THE FIELD!
* LICENSED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE!**

VIPOL 717 INTRAMUSCULAR

An Exclusive Vineland Poultry Laboratories Product

Protects Chickens and Turkeys 14 Days of Age and Older

NEVER BEFORE . . . in the History of Human or Animal Research has any Vaccine . . . or like product . . . been so Thoroughly Field-Tested on so Vast a Scale . . . before being offered to the public!

VIPOL Automatic SYRINGE

ATTENTION! ALL POULTRY PRODUCERS, HATCHERYMEN AND POULTRY SUPPLY DEALERS!

VINELAND POULTRY LABORATORIES

FOUNDED IN THE YEAR 1916

VINELAND, NEW JERSEY

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Mass application methods were developed in large (25,000) dose vials. (ND, IB, MD, IBD, Reovirus, LT). Coccivac by coarse spray or gel in the hatchery reduced amount of anticoccidials in use.

Salmonella sp. vaccines in broilers and breeders for Public Health.

Recombinant vaccines with HVT and Pox vectors + Molecular Diagnostic techniques; AC and AB ELISA, PCR, PCR with RFLPs, and whole genomic sequencing developed.

Studies of the Microbiome and how it impacts poultry health. Use of Genomic Selection using AI for breeding to increase resistance to various diseases and improve production traits. Plasmid vaccines for immune stimulation.

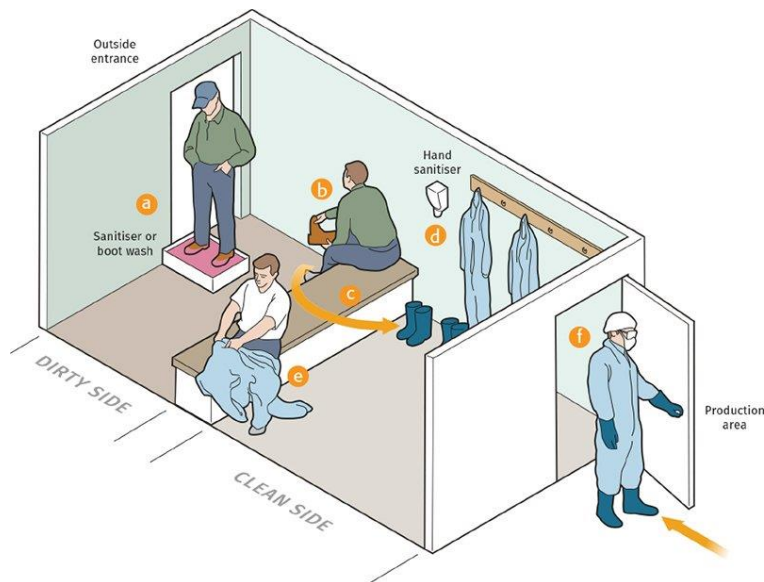
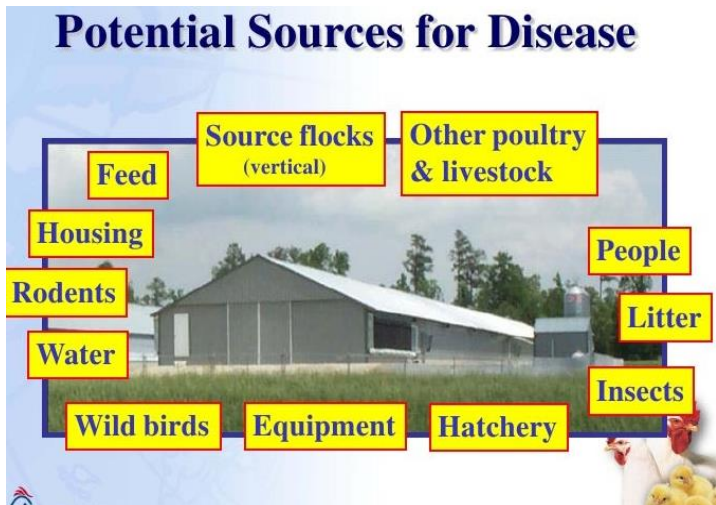
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Mass Vaccination Application Techniques



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Biosecurity to Prevent Infectious Diseases



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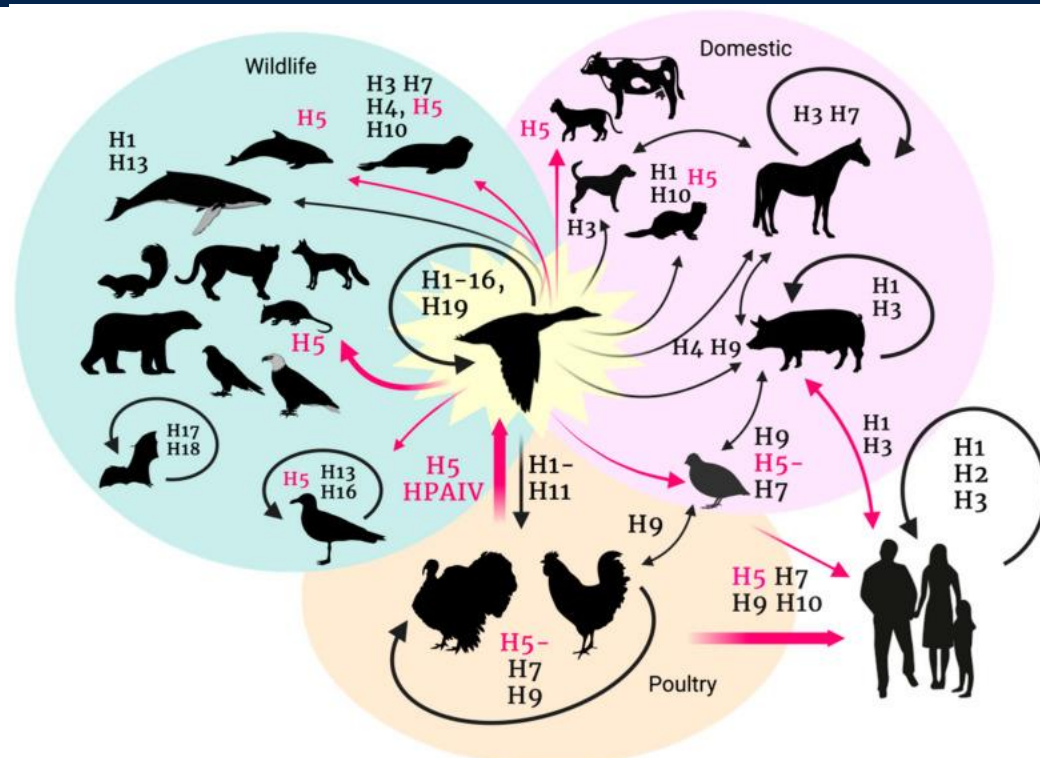
Avian Influenza Species Affected

Birds (145 species)
 Waterfowl (10% in Ducks)
 Shorebirds
 Vultures
 Raptors
 Cage birds (zoos and aviculture)
 Poultry

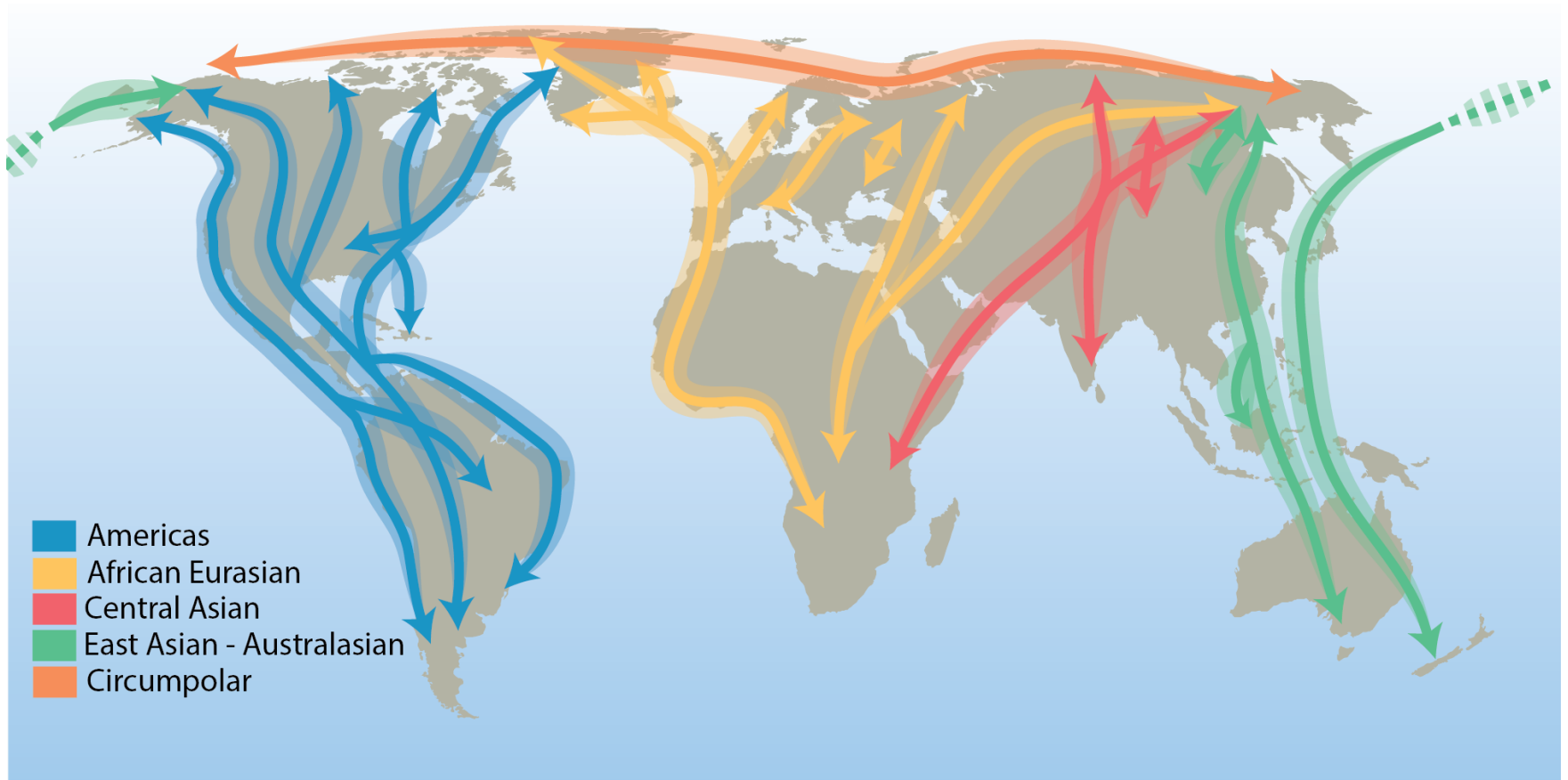
Mammals

Pigs, horses, mink, cats, dogs, ferrets, martens, skunks, foxes, coyotes, racoons, bob cats, mountain lions, bears, foxes, tigers, lynx, horses, leopards, cheetahs, palm civets, dolphins, seals, whales, humans, and other. Recently **Dairy Cows (929 herds)** showed illness and produced contaminated raw milk which sicken farm workers (70) and domestic cats (19) on dairy farms and poorly processed meat from dairy cows in pet food. New **H5N1 flu** tests and vaccines for dairy cows and dairy and poultry farm workers.

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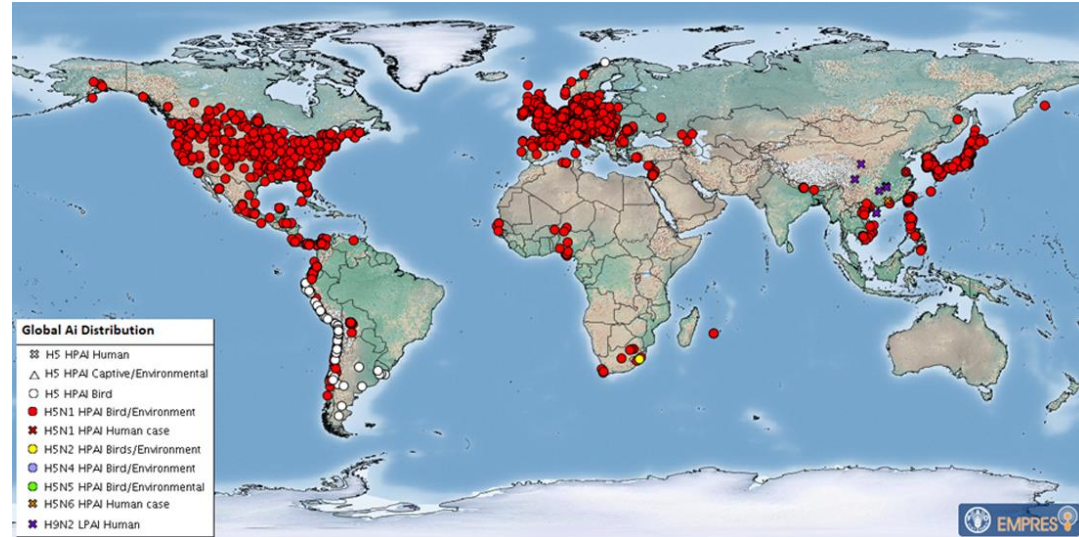
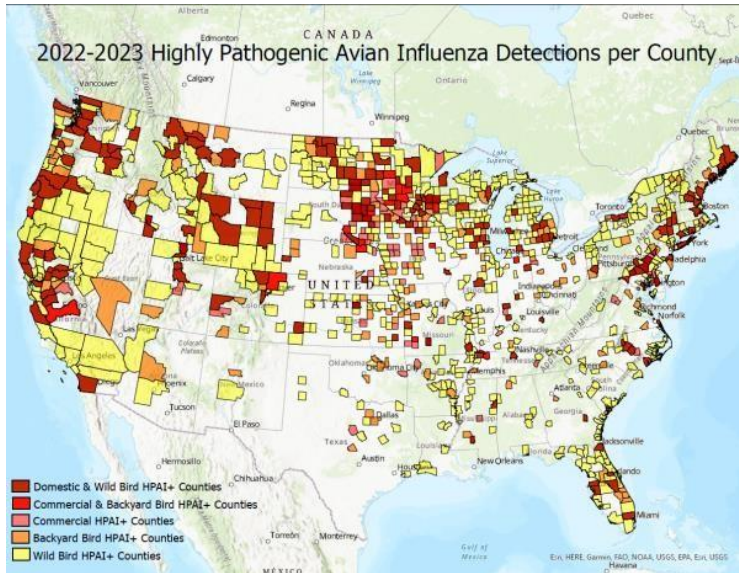


Migratory Patten of Wild Water-Fowl in the World



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Avian Influenza Map for Domestic and Wild birds

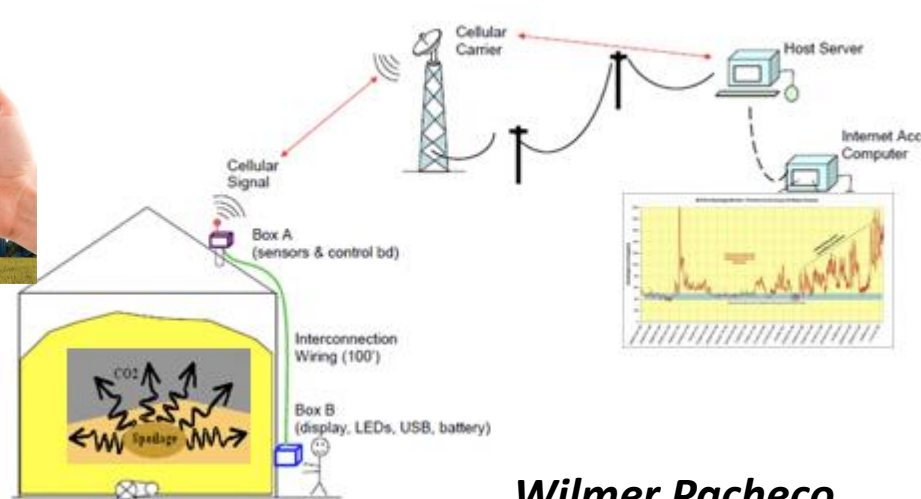


Losses to the Poultry Industry from the 2020 – 2024 Avian Influenza (HPH5N1) outbreak were 145 million in the US (50 million in 2024 and 13 million in last month), 60 million in Mexico, and 10 million in Canada.

[Track 2022-25 avian influenza outbreaks in North American poultry | WATTPoultry.com](#)

Commercial Feed Mills

- The feed industry evolved from water powered mills 200 years ago to fully automatized mills able to produce more than 20,000 tons per week
- Quality control of ingredients and finished feeds
 - In-line NIR spectrometry and Pellet Durability Index
 - Decrease microbial contamination
- Automation in grinding, mixing, pelleting
- Evaluate the condition of grains during storage (temperature, moisture, and levels of CO₂)



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Poultry Nutrition

Diets are formulated at Least Cost based on the age of the bird. They are data-driven to optimize nutrient use and reduce waste. (*Probiotics, prebiotics, synbiotics, enzymes, essential oils, organic and inorganic acids, yeast cells, and phytoceuticals may be added to increase digestion and absorption of nutrients*).

<u>Nutrient Class</u>	<u>Role in Poultry Health</u>	<u>Common Sources</u>
Carbohydrates	Primary energy source	Corn, wheat, barley
Proteins	Growth, tissue repair, egg production	Soybean meal, fish meal
Fats	Energy, absorption of fat-soluble vitamins	Vegetable oils, animal fats
Vitamins	Metabolic functions, immune support	Vitamin supplements
Minerals	Bone health, eggshell formation, enzyme function	Calcium, phosphorus, trace minerals
Water	Hydration, digestion, nutrient transport	Clean, fresh water

Commercial Hatcheries

- Designed to hatch fertile eggs from breeder farms
- Fertile eggs are placed in setters in incubator rooms then transferred to hatchers at 18 days in a separate room. Rooms are monitored to ensure that correct temperature and humidity levels maintained throughout the incubation period
- More than 120,000 eggs per machine and 12 machines per hatchery (2+ million week)



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Commercial Processing

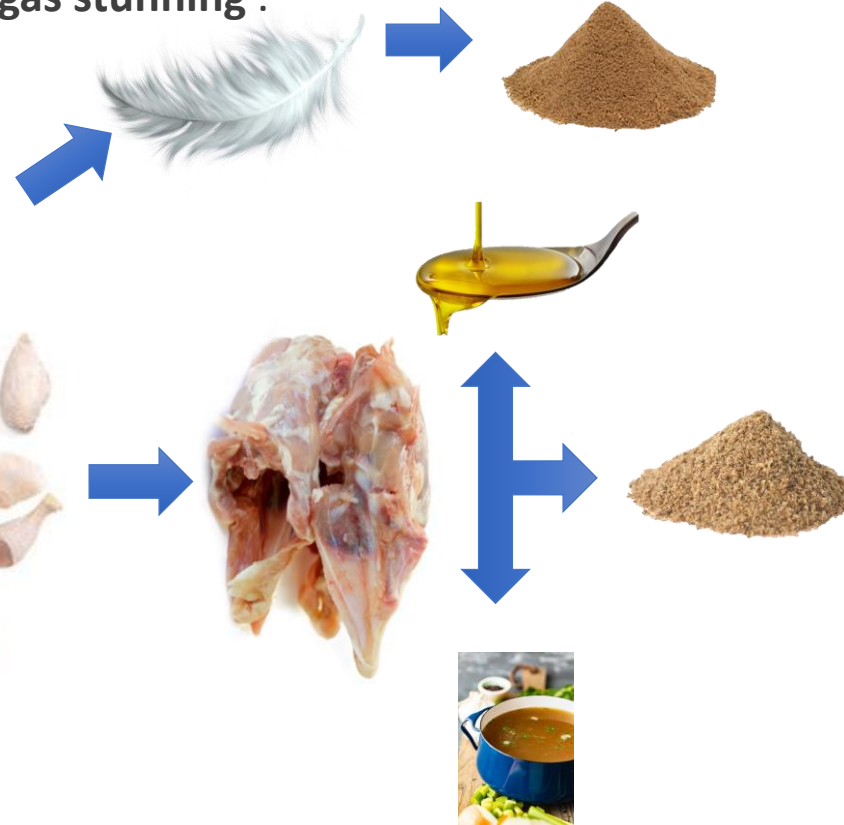
Traditionally, chickens were sold to wholesalers either alive or what was termed “New York dressed” — that is, with the feathers removed but the head, feet, and innards intact. New mechanical bird catching equipment and plant gas stunning.

1942



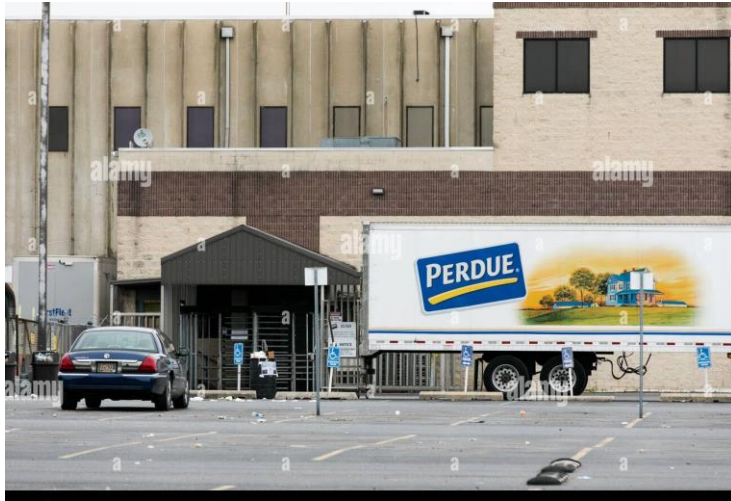
Dressed Chicken

2020



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Commercial Chicken Processing Plant



140/minute 200,000/day



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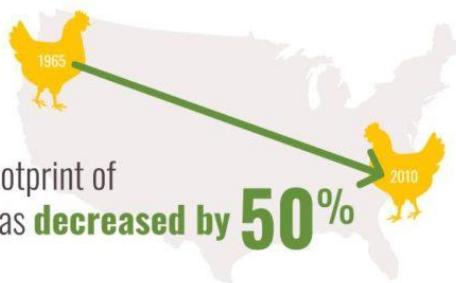
Sustainability

- The industry evolved to be a more cost-effective production and processing system resulting in a more affordable product and profitability for the integrator and farmer.
- Requires less resources (water, feed, land).
 - Improvements in FCR, livability, and BWG.
 - Generates less CO₂ as the industry moves towards carbon neutrality.
 - Less waste with less water are generated and water recycled and/or filtered, and most by-products are transformed into value-added products.

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Sustainability of the Poultry Industry

Chicken Production in the U.S. is More Sustainable Than Ever Before



The environmental footprint of chicken production has **decreased by 50%** since 1965.

It takes **75% fewer resources** to produce the same amount of chicken than it did in 1965!



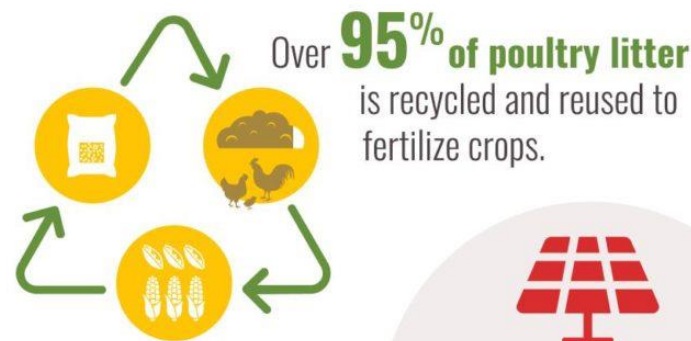
72% less
farm land



58% less
water



39% less
fossil fuels



36% reduction in
greenhouse gas
emissions



Chicken farmers are continuously adopting **new technology** to reduce energy use.



Study Reference: Putnam, Ben, et al. "A retrospective analysis of the United States poultry industry: 1965 compared with 2010." Agricultural Systems, vol. 157, 2017, pp. 107-112.
Note: All metrics referenced are in terms of 1000 kg of live weight broiler poultry.

<https://www.chickencheck.in/faq/sustainability/>

Additional Sustainability Factors

Companies must be environmental stewards, socially conscious (practice inclusiveness and be gender neutral) and fully transparent and practice animal and employee welfare.

National Chicken Council developed the Animal Welfare Guidelines and Audit Checklist as a baseline for farmers and processors to ensure chickens are properly cared for and treated humanely.

Carefully formulated feed, access to a plentiful supply of clean water, adequate room to grow, veterinary attention, and proper handling are all important factors in the management of broilers, and production of high-quality food products.

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Proposed Provide Environmental Enrichment



- There are many approaches to in-house enrichment for broiler chickens: More than **FLAWS** (feed, light, litter, air, water, sanitation, security, and space).
- **Natural light from windows** (AU \$300,000 NIFA grant)
- **Elevated perches:** Providing bales of hay/straw, ramps, tables/platforms, perches and other structures encourages climbing and resting.
- **Hiding spaces:** Using bales of hay/straw, boxes and buckets/drums creates areas for chickens to conceal themselves.
- **Pecking opportunities:** Hanging baskets of hay/straw/cabbage and interesting objects facilitates pecking or interaction.
- **Free Range vs Pasture Raised Poultry**

***Bruce Stewart Brown** DVM, DACPV, Perdue Farms*

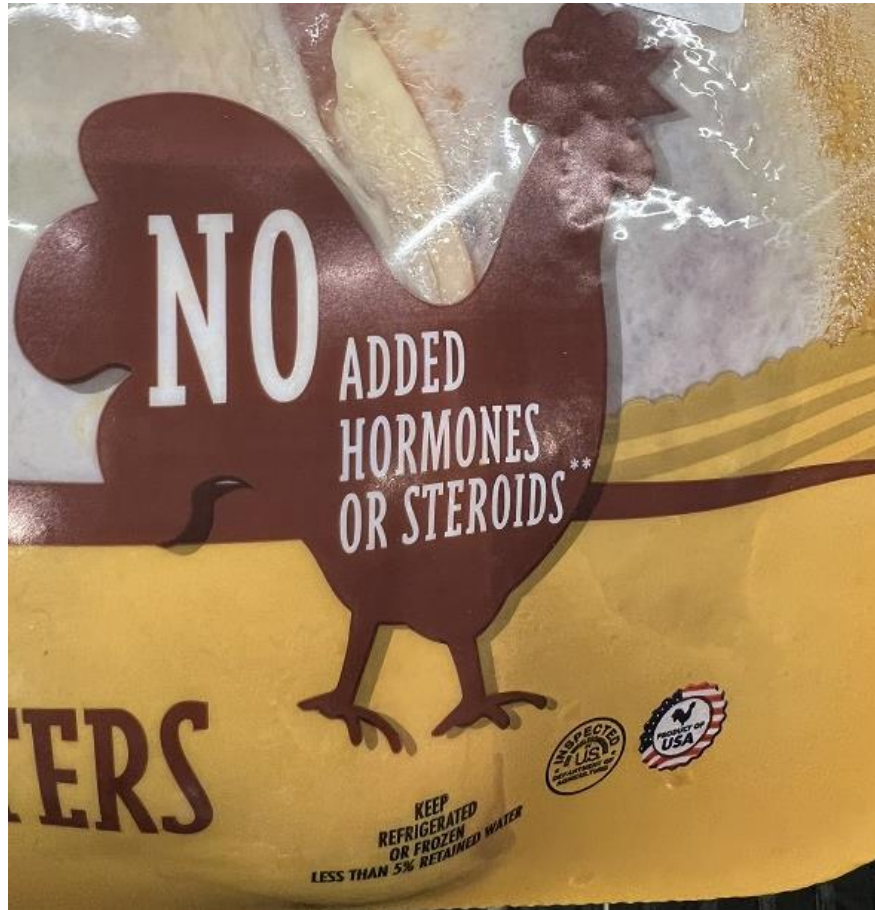
Organic Free Range and Pasture Reared Poultry



Changing consumer preferences, including stringent labeling and transparency, educate the consumer, and increased demand for organic **(no antibiotics or GMO grains)** and free –range poultry products.

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Consumers need education



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Which chicken is more nutritious?



Conventional



Organic Free Range



Slow Growth

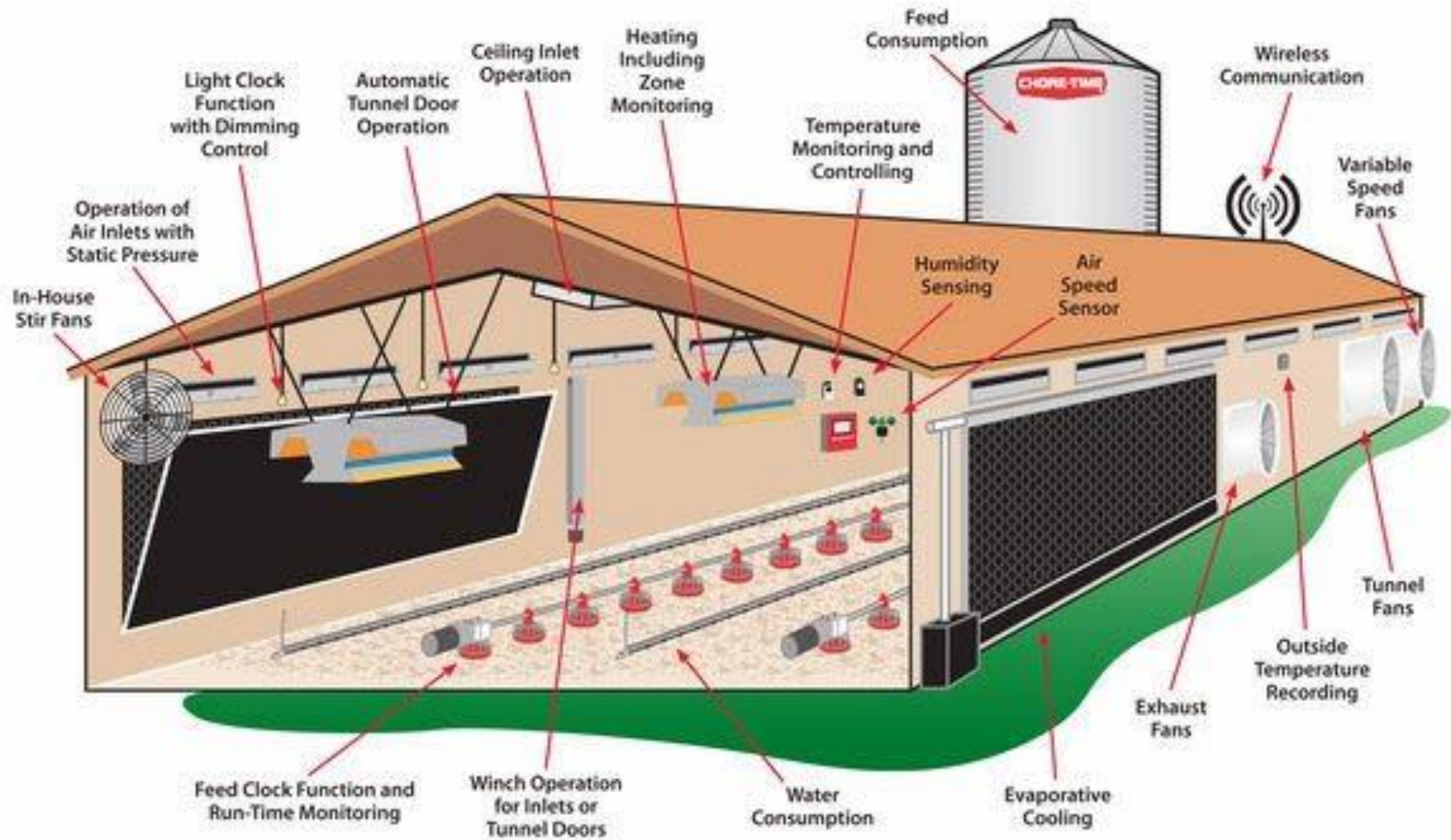
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Future of Poultry House Construction



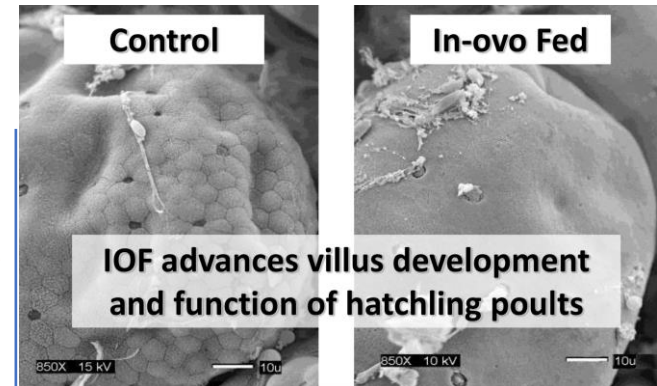
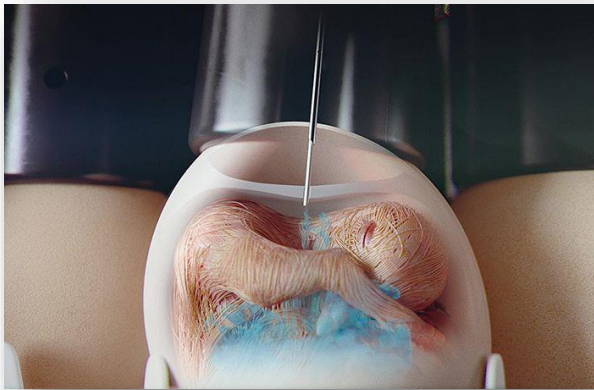
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Future of Poultry House Construction



Possible Future of Poultry Production?

- In-ovo nutrition and In-ovo sexing machines and to improve efficiency and welfare



Probiotics – prevent infections
Amino acids – muscle development
Vitamins C and E – Immunity
Carbohydrates Glycogen stores
Insect meal

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Hatching Chicks on the Farm??

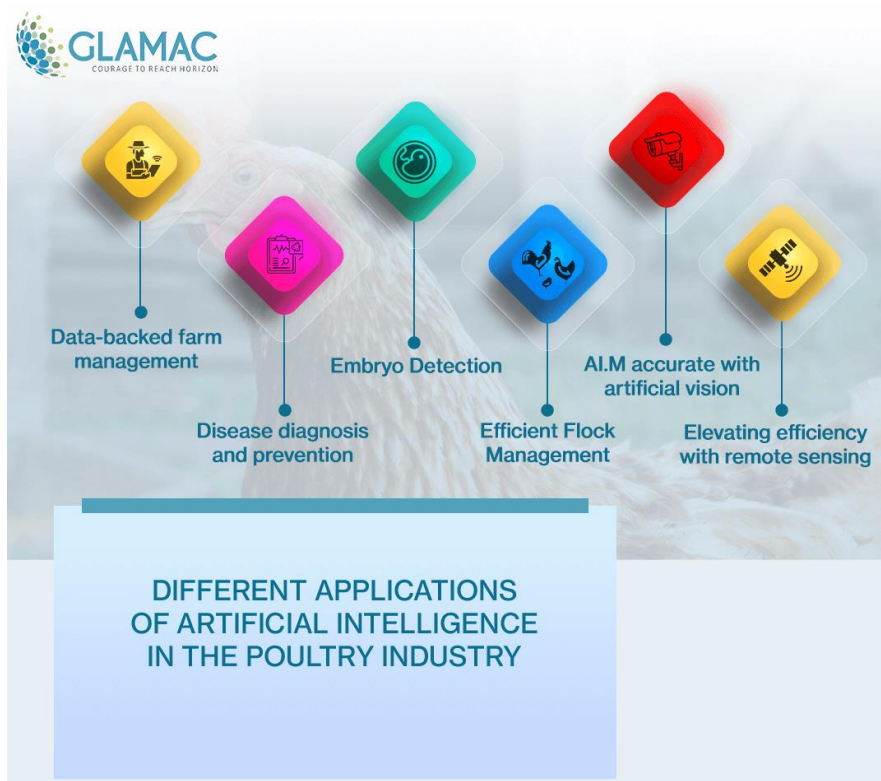
- In commercial hatcheries, some chicks hatch early and need to stay in the hatcher until most of the remaining eggs hatched out. Maybe large company owned farms to combat the problem?



<https://www.vencomaticgroup.com/on-farm-hatching>

The Future of Artificial Intelligence in Poultry Production

Whole house WFI with sensors, robots, and cameras to assess and enhance the ventilation, ensuring a comfortable environment, extend data collection on aspects like microenvironment, behavior, health, and movement. All functions can be controlled with a computer or smart phone to reduce human entrance and increase biosecurity.



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Additional Future Technology in Poultry Production



- 1) **Efficient Filtration of air** prevent organic materials (feather and dander from wild birds) from entering the house and ammonia and organic material from existing the houses.
- 2) Use of **Laser Technology and Scaring Signals** to keep wild birds and other animals away from poultry farms.
- 3) **Intelligent In- House Sound (Vocalization) Monitoring** to determine house health and welfare.
- 4) **Virtual Reality (Tour) and AI** to more quickly teach Commercial Poultry Employees and Farmers and College Student Poultry Farming and Production.
- 5) **Food Futurists** to determine what consumers of tomorrow (Generation Z) will purchase.

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Thanks, and Questions?

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