

Global Opportunities and Current U.S. Agriculture

August 5-9, 2007

Beijing China

H.W.Ockerman and Lopa Basu

52 nd
International Congress
Meat Science and Technology
Harnessing and exploiting Global
Opportunities

August 5-9,2007
Beijing China

2005



North Pole

2005





2005

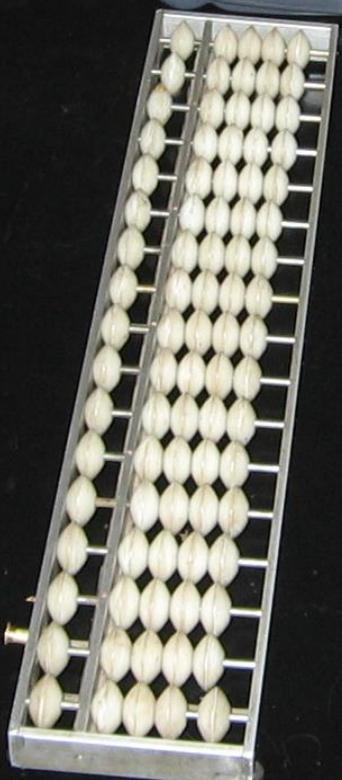


Dry
Cured
Hams,
SW
China

Dry Cure Ham Plant SW China

New Old

2005



A large number of dried ham legs are hanging in a curing facility. The hams are suspended from wooden racks by ropes, with some secured by small wooden blocks. They vary in color from pale yellow to deep reddish-brown, indicating different stages of cure. The background shows more hams in the distance, and a person is visible taking a photograph on the right side.

2005

Dry Cure
Ham
Ageing,
SW China



**Water
Buffalo,
SW
China**

2005

Mud and Straw Construction, Farm Building,. SW China

2005



Fruit, SW
China

2005





A vintage green tea twisting machine, featuring a large circular wooden base with a metal frame. The top assembly is made of dark wood and metal, with a prominent green painted metal wheel on the right side used for operating the machine. The machine is situated on a light-colored floor, with a window and some vertical poles visible in the background.

**Tea
Twisting,
SW China**

2005

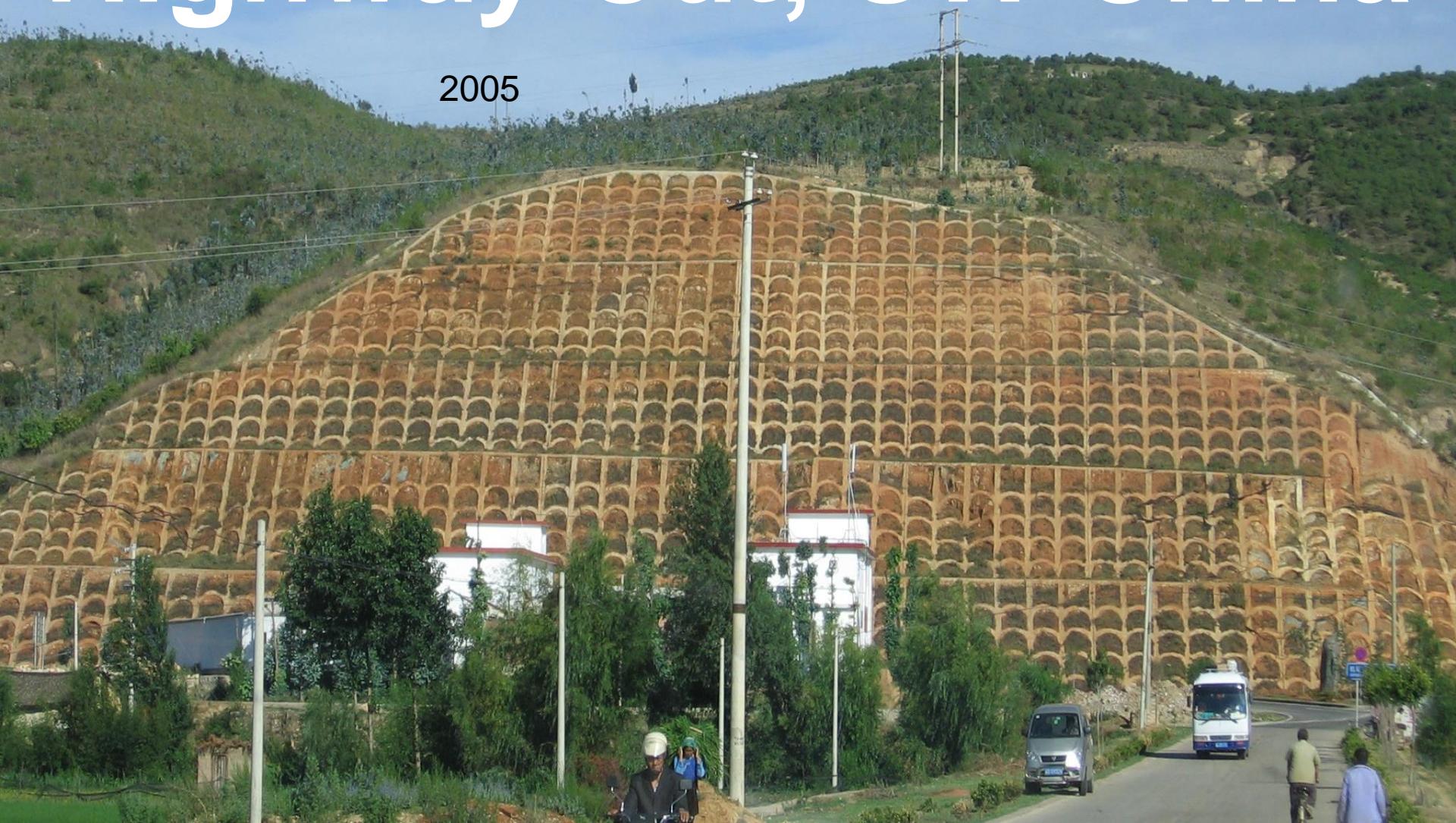
Dali Univ. SW China

2005



Erosion Control on Highway Cut, SW China

2005



2007



Night Food
Market, Squid



Banner at a 2007 China Conference
suspended by a helium balloon.
Banner brought back and
photographed at OSU

Dr Chen, Professor in Taiwan and an OSU alumni who established this experimental farm in mainland China and organized the conference in China

2007



Trends of Modern U.S. Agriculture in the Last Decade

过去十年来美国农业之发展状况

By

Professor Herbert W. Ockerman

The Ohio State University, USA

美国俄亥俄州立大学 欧克曼教授

Chungsa, Hunan Providence, China

中国湖南省长沙市

Illegal Agriculture Labor 非法农业劳 工

- Often uneducated – lower price labor 多半为低教育程度低收入
劳工
- More international competitive 较具有国际竞争力
- Vote for a more social welfare system 支持要求更多之社会福利
支持
- Food organ not particularly important 对于食物要求不高
- Quality at a reasonable price 以薪资而言，劳工素质尚称合理

Types of Crops 作物种类

- Organic – no fertilizer, pesticides, hormones 有机产品—不施以化学肥料杀虫剂、荷尔蒙
- Local crops – less time in transport 本地所产之作物—减少运输所需时间
- Country of origin – some countries lack controls, standards vary 来源地—部分国家管控较松，标准不一
- Tractability – difficult when sources are mixed 追溯系统—当来源混合时困难执行
- Farm to plate safety important 从「农产到餐桌」安全概念之重要性
- Pollution, important but difficult to control 污染属重要议题，但较难管控
- DDT has its place when used in appropriate location and sparingly 使用DPP需要特别留意使用场所及谨慎小心

Horticulture 园艺作物

- Genetically Modified Products 基因改造产品
- Some consumers don't want – marketing problems 部分消费者接受度低—销售困难
- Some fear weeds will modify 部份人士担心野草可能被基因改造
- Scientist - after approval they are safe 科学证明基因改造产品之安全性

Genetically Modified Food Labeling 基因改造食品之标示

- In 1992 FDA ruled – Labels not required unless modification significantly alters the properties 1992美国食品药物管理局规定－除非食品的特性明显地因基因改造而改变，否则无须标示
- ~ 87% of UA Soybeans are GM to tolerate herbicides, Roundup ready (no-till possible) 大约87%的美国黄豆属于基因改造，用以减少除草剂之使用
- ~35 % of US corn crop are GM to resist European Corn Borer and corn rootworm, high lysine 大约35%的美国黄豆属于基因改造，具有抗欧洲玉米螟及抗玉米根虫及高离胺酸含量之特性
- USDA – says indistinguishable from non GM 美国农部－无需与非基因改造食品有所区隔
- If labels were required – 66% of US food would have to be labeled 若是规定产标示必须标出－66%美国食品就必须标出其为基因改造食品

Animal Industries 动物生产产业

- Animals must be healthy and well cared for 动物应保持健康状态，更需要良好的照顾，可藉由下列事项达成：
- Receive medical care, vaccinations and treatment 接受健康医疗照顾，疫苗注射及治疗
- Nutritious diet, access to fresh clean water 营养的食物及干净饮水之供给
- Healthy living conditions 健康的生活状况
- Handling gently 温和非粗暴地对待
- Comfortable surroundings 舒适之生活环境

2007

Animal Production 动物生产

- Animal welfare is important and being addressed 动物福祉非常重要，且日益受到重视
- Embryo transfer is successful but expensive 胚胎移植已可成功操作，但费用昂贵
- Cloned animals are currently being researched 动物复制相关研究持续进行中
- Animal identification is needed 动物识别之需要性

Dairy Industry 乳类产业

Sex Seamen – Select Sires, 75% usage 精液—公畜选拔

- Brazilian Co. Purchase of Swift, Largest Meat Conglomerate – Easier route to Asia 巴西公司并购Swift 最大之肉品集团公司，更易打入亚洲市场
- DDT is starting to make a come-back DDP卷土重来
- Illegal Labor – 5 of 50 states more than 50%, 50% drop out of school before finishing High School 非法劳工—美国50州中的5州，有超过50%的学生在完成十二年的义务教育前辍学
- Safety (sanitation and pasteurization) and quality critical 产品安全(卫生及杀菌)及质量非常重要

Dairy Continued 乳类产业

- No antibiotics, animals may be treated but milk does not go into food supply 抗生素可使用来治疗动物疾病，但不可因此而进入供人饮用之乳类中
- No pesticides 不可施用杀虫剂
- Hormones are naturally present in plants and animals 天然存在于植物及动物体内之荷尔蒙
- BGH (bovine somatotropin) occurs naturally in cows – helps direct milk production BGH(牛生长素)天然存在母牛体内，有助于乳牛之生产
- rBST (synthetic copy of BGH) approved by FDA in 90's and is species-specific, not labeled r BST(合成之BGH)在1990年代获得美国FDA(食品及药物管理局)之批准，可使用于特定之品种，而且不必标示
- FDA – voluntary moratorium on food from cloned animals FDA关于源自于复制动物所产制食品之义务延期偿付

Poultry 家禽生产

- Driven by consumers 生产受到消费者需求而影响
- Egg – more space for layers – McDonald led the way 蛋－提供产蛋鸡更多生活空间，由麦当劳推动开始
- Meat – convenience – preparation in 20 min. or less 鸡肉－食用方便性，可在20分钟(或更少时间)内完成烹调或准备
- Corn, ethanol – distillers grain and solubles will be used 玉米 乙醇－蒸馏谷物与可溶解物之使用
- Decrease production – first time in many years 生产量减少－过去多年来首见
- Antibodies out – probiotics in 减少抗生素使用 改用益生菌
- GM grains are important to this industry 基因改造之谷物 非常重要

Meat Harvesting and Processing

肉用动物屠宰与加工

- Food Safety must be stressed with a strong inspection program and HACCP - this requires commitment, personal training, participation of problems, motoring production, controlling critical control points, keeping records.
- 藉由严格的屠宰与肉品检查及HACCP系统之执行，以确保食品的安全，其成功与否亦需要依赖：执行的决心、员工训练、积极参与、监测、重要管制点之控管，纪录保持等工作。

Meat Continued 肉类之生产与消费

- Consumers is demanding convince and fast (microwaveable) preparation 消费者对于方便快速可准备(例如:微波食品)的需求日增
- Precooked is gaining popularity 已事先烹煮过, 买回后只要加热即可食用之食物, 日益受到消费者欢迎
- Gourmet, often precooked, is starting to appear, often with take out capabilities 已事先烹煮好, 购买后即可食用的外带食物的消费日益增多
- Variety and ethnic foods are in demand 各种不同产品, 特别是具各国特色的美食需求增加
- Size selection is increasing from single households to banquet 产品量的选择更多元化, 从适合小家庭的量, 直到宴会所需之量皆可。

Animal Pollution Problems

动物污染之难题

- Odors – a good handling system is important and communication with neighbors is critical, don't haul manure during their outdoor activates.
不良气味：一套很好的处理系统及邻居良好的沟通与互动是非常重要的
- Waste water, feed lot runoff, liquid manure, silage leakage, getting into ditches and streams, management critical
废水、剩余饲料、粪尿、外漏青贮饲料等
污染溪流或沟渠
- Tracking waste onto road – management
废弃物运输追踪管理
- Fish kill down stream – management
溪流中死鱼之处理
- Dead animals in sight – management
死亡禽畜尸体之
处理

Restaurant consumption is increasing

餐厅进食的人口增加

- Fancy, white table cloth for the affluent and special occasions 新颖、高档的餐饮内容，例如：特别丰盛的餐点或是特别场合及时之聚餐
- Fast food with variety (hamburger, pizza, chicken, fish, desserts) food and ethnic choices 各式快餐餐厅(例如：汉堡、披萨、鸡肉、鱼肉、甜点及异国美食等)
- Fast food is also trying to cater to the health concupiscence crowd with lower calorie offering and to the over eaters by offering king sizes 快餐餐厅亦有所转变，例如：提供低卡热量之餐点，不同份量需求(例如：King size大份量的餐点提供给食量大之顾客)
- This industry is also driving many reforms such as animal welfare, elimination of some additives, elimination of trans-fatty acids, no smoking and etc. 快餐餐厅受到许多外在因素影响，也必须有所调整，例如：动物福祉考虑、减少特定添加物之添加量、不使用反式脂肪酸、餐厅内禁烟等。

Beverages 饮料

- Beer is favorite drink particularly of the college group, sports enthusiast, physical labors 啤酒是最受欢迎的含酒精饮料，大学生、球迷及劳工等特别喜欢饮用啤酒
- Wine is gaining in popularity, and is considered a more sophisticated drink 酒精含量较高之酒类的消费量日增，而且饮酒文化更复杂多元
- Soft drinks are consumed in great quantities, and is usually offered on both sweet and diet formats in a large number of flavors 软性饮料(指不含酒精之饮料)消费量大幅增加，目前除一般普通甜度外，各种口味的代糖(或低热量)饮料也渐受欢迎
- Coffee and tea is also consumed in large quantities with some coffee houses offering special flavors and internet connections 咖啡及茶消费量也很大。有些咖啡厅不仅供应各种口味之特调咖啡，也提供消费者网络上网之服务。

Sweets and salted 各式甜、咸点心

- Candy, cookies, cakes, pies in all types of combination and flavors. Available in ready to eat or box mixes or cook at home.
各式各样糖果、饼干、蛋糕及派等组合。购买时可单独购买或是混合选购，带回家可即食或是简单料理即可食用

- Peanuts (or other nuts), popcorn, pretzels, potato chips, puffed items often cheese flavored, party mixes, pork rinds are all popular snacks 花生(或其它坚果类)、爆米花、椒盐脆饼、洋芋片、各式填充起司的点心、派对上吃的小点心等都很受到消费者的喜爱

Frozen foods and TV dinners

冷冻食品与电视餐 (TV dinner)

- Variety here is also important, prepackaged ready to cook (microwave or boil in bag), vegetables, pizza, breads, desserts, meats and meals 多样化非常重要，事先包装好，买回家简单料理(例如：微波炉加热或直接原包装放入热水中加热)即可食用，例如：蔬菜、披萨、面包、点心、肉类及餐盒等

2007

- Locker plants have diminished in number but some are till very popular where you can purchase a whole animal, have it cut packaged and frozen to your specifications and take it with you to your locker or rent frozen storage at the plant. “Locker plant”型态的工厂数目日益减少，但仍有部分存在 (locker 原亦是指置物柜，此指肉品屠宰加工厂内之低温贮藏库)在厂内，消费者可先购买整头家畜屠体，然后依据消费者个人的喜好与规格要求，进行分切、包装、冷藏，消费者再将其带回家或是存放在工厂内冷冻库中。

American Agriculture - Animals

by Professor Ockerman &
Lopa Basu

From
The Ohio State University
<http://photolib.ag.ohio-state.edu/>

USDA
<http://www.ars.usda.gov/is/graphics/photos/>

A large stack of round hay bales, viewed from the side, showing their textured,螺旋形 (spiral) structure.

Round bales of hay

2007

2007

Corn



Soybean harvest

2007





Fermented Feed Storage

2007



PASTURE

2007

A close-up photograph of a field of alfalfa plants. The plants are lush and green, with trifoliate leaves and small, delicate purple flowers. The perspective is from a low angle, looking up at the dense canopy of leaves.

2007

Alfalfa-pasture/hay



2007

Beef



Angus Beef

2007

2007

Roundup





2007

Beef Feedlot

**osu
Meat
Lab**

2007

Meat Case



2007

meat

2007

A photograph of a rural dairy farm. In the foreground, a large herd of black and white cows is grazing in a green field. Behind them is a low, light-colored stone wall. Further back, there's a mix of agricultural buildings: a prominent red barn with a white roof and a dark wooden stable or stall. To the right of the barn are two tall, white cylindrical silos. The background is filled with a dense line of mature green trees under a clear blue sky.

2007

Dairy Farm



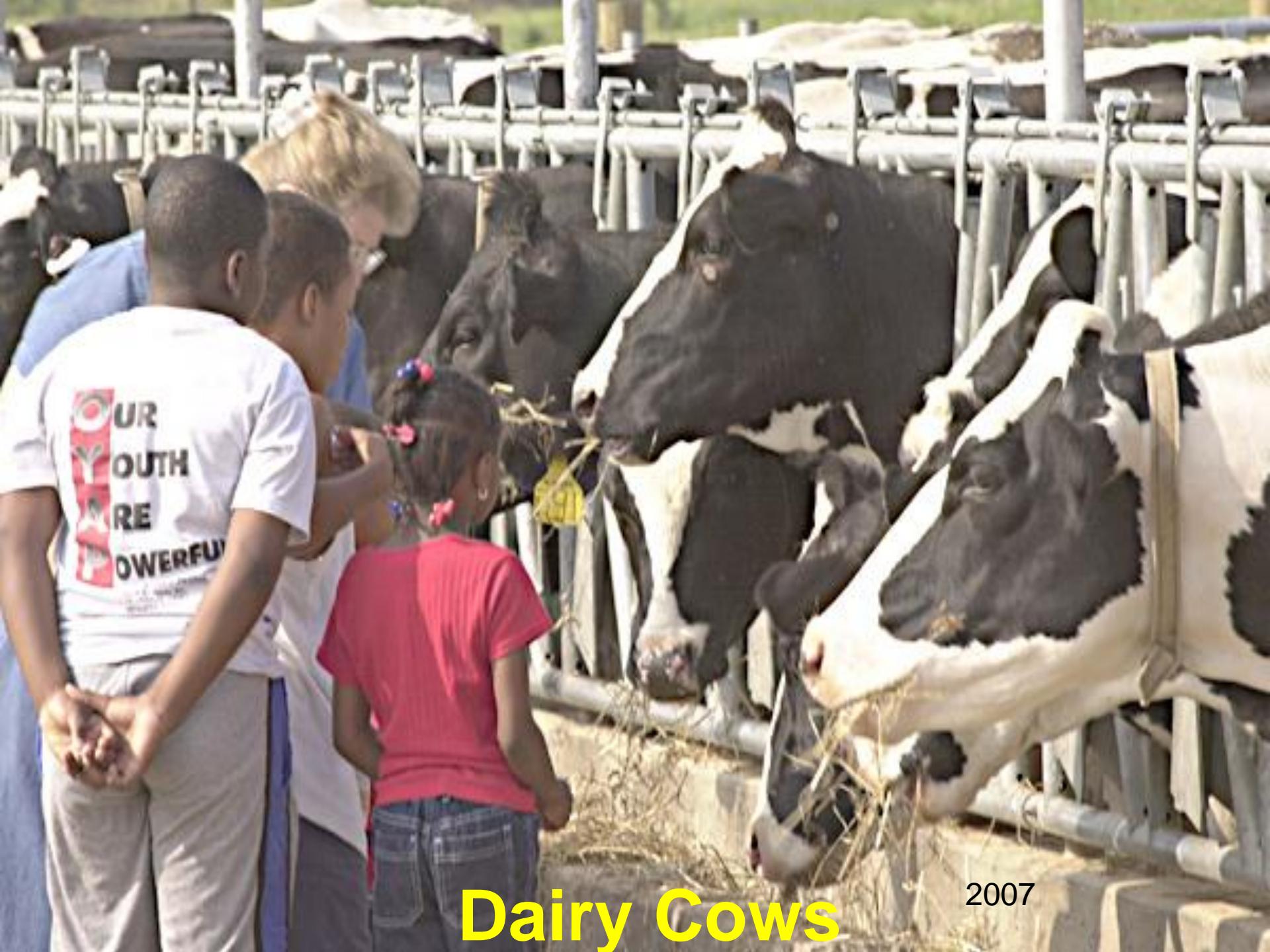
Dairy Calf

2007

An aerial photograph of a dairy farm. The central focus is a large complex of white agricultural buildings, including several long barns and tall cylindrical silos. To the right, there's a smaller cluster of buildings and a long, low-profile structure, possibly a milking parlor or another type of barn. The farm is situated in a rural area with a mix of green pastures and brown, plowed fields. A network of roads and paths cuts through the land. In the background, there are more fields and some scattered trees. The overall scene is a typical representation of a mid-sized dairy farm.

Dairy Farm

2007



Dairy Cows

2007



Young pigs

2007

A photograph showing two pigs in a pen. One pig is white and the other is dark-colored. They are standing on straw bedding. A metal fence is visible in the background.

Pigs

2007



Sheep

2007



Sheep

2007

2007





Sheep barn

2007



2007

HatchedChicks

2007



Mature Chickens



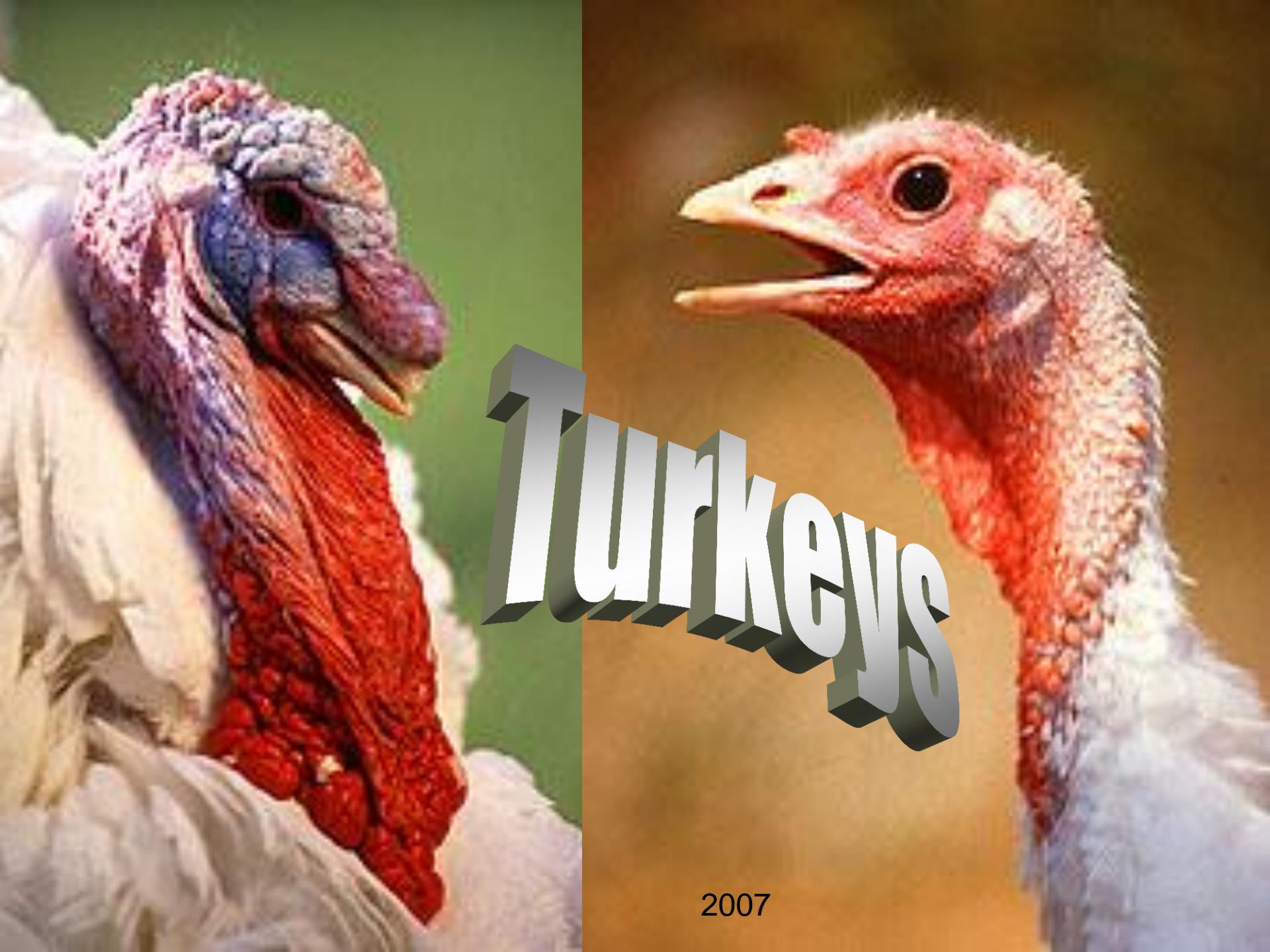
Eggs

2007

chicken meat



2007

A composite image featuring two turkeys facing each other. On the left, a turkey is shown against a green background, its head turned slightly to the right. On the right, another turkey is shown against an orange background, its head turned slightly to the left. The two birds are positioned as if they are communicating.

Turkey vs

2007



2007



Fish
Farmed
Wild

2007



2007

American Agriculture - Buildings by Professor Ockerman & Lopa Basu

From
The Ohio State University
<http://photolib.ag.ohio-state.edu/>

USDA
<http://www.ars.usda.gov/is/graphics/photos/>



Farm

2007

Farm

2007



An aerial photograph of a large agricultural facility, likely a dairy farm, situated in a rural area. The complex includes several large white barns with dark roofs, a central processing building with a tall white silo, and various smaller outbuildings. The property is surrounded by a mix of green fields and some brown, harvested areas. A dirt road leads to the facility from the bottom left. In the background, there are more fields and a line of trees. The year '2007' is printed in the top right corner.

2007

Farm

2007

Barns



Dairy Farm

2007





2007

Farm

A photograph of a red barn with a white roof and a large silver silo in a green field. The word "Barn" is overlaid in a large, colorful font at the top right.

Barn

2007

An aerial photograph of a large agricultural complex, likely a dairy farm, situated in a rural area. The complex includes several white barns with dark roofs, tall cylindrical silos, and a long, low-profile building, possibly a milking parlor or storage facility. The property is surrounded by a mix of green fields and some brown, harvested areas. A dirt road winds through the fields, leading towards the farm buildings. In the background, there are more fields and a few small buildings, possibly houses or additional farm structures.

Farm

2007

Farm



2007



Family farm

2007

2007

Farm





Barn and hay

2007



Stairs on
side of
grain bin

2007



A photograph showing five large, cylindrical concrete silos standing in a row against a clear blue sky. The silos are made of grey concrete with visible vertical reinforcement bars. The lighting creates strong shadows on the left side of the image.

silos

2007

siIos



2007



Filling Silos

2007

2007

silos





Silos &
Feed Wagon

2007

GrainBins

2007



Grain Bins

2007



Milking Parlor

2007

Equipment Shed



2007



Green houses

2007

Greenhouse

2007



2007





2007



Lighted Greenhouses

2007



HARVESTING AND Mills

2007

American Agriculture – Equipment by Professor Ockerman

From
The Ohio State University
<http://photolib.ag.ohio-state.edu/>

USDA
<http://www.ars.usda.gov/is/graphics/photos/>

2007

Farm Science Review



2007



Yesterday

2007



Soil Sampling Equipment

2007



Disk

2007

2007

Planting Equipment





Combine

2007

2007

Winrowing wheat



Harvester



2007

Corn harvest

2007





Harvest Soybeans

2007

Harvest soybeans

2007





2007

Robot Tomato Picker

Tomato picker



2007

Egg Breaking Equipment

2007



Satellite Controlled Tractor



2007

2007

No Till Drill



2007

Round bailed hay



Farm Animal Trailer



2007

2007



Computer for Tractor

Meter for Tractor



2007



Power Washing

2007



Sprayer

2007



Spraying trees

2007



Spraying

2007

American Agriculture - Extension by Professor Ockerman & Lopa Basu

From
The Ohio State University
<http://photolib.ag.ohio-state.edu/>

USDA
<http://www.ars.usda.gov/is/graphics/photos/>

Community Development

2007



Introduction to Poultry

2007





Raising Ducks

2007

Daughter day



2007

A close-up photograph showing a person's hand holding a small, translucent yellow plastic container. The container is tilted, and numerous tiny, silvery fish are pouring out into a vast, dense school of similar fish swimming in a bright green, slightly cloudy liquid. The background is filled with the silhouettes of thousands of these small fish.

2007

Fish Demonstration



Ear tag

2007

Food Science Lab

2007

2007

Sewing

2007

Turf grass



Gardening

2007



Wind Power

2007





Soil Sampling

2007



Pollution
Pollution
Control

2007



Health

2007

4H Camp

2007



Farm Science Review

2007





Farm Science Review

2007

Farm Science Review



2007

Farm Science Review

2007



Farm Science Review

2007



Farm Science Review



2007

Farm Science Review

2007



Farm Science Review



2007



Woodworking Class

2007



Electronic Nose

2007



Land Survey

2007

Slow farm equipment



2007

Safety



2007

2007

4-H Quilt



Bee Keeping

2007



Awards



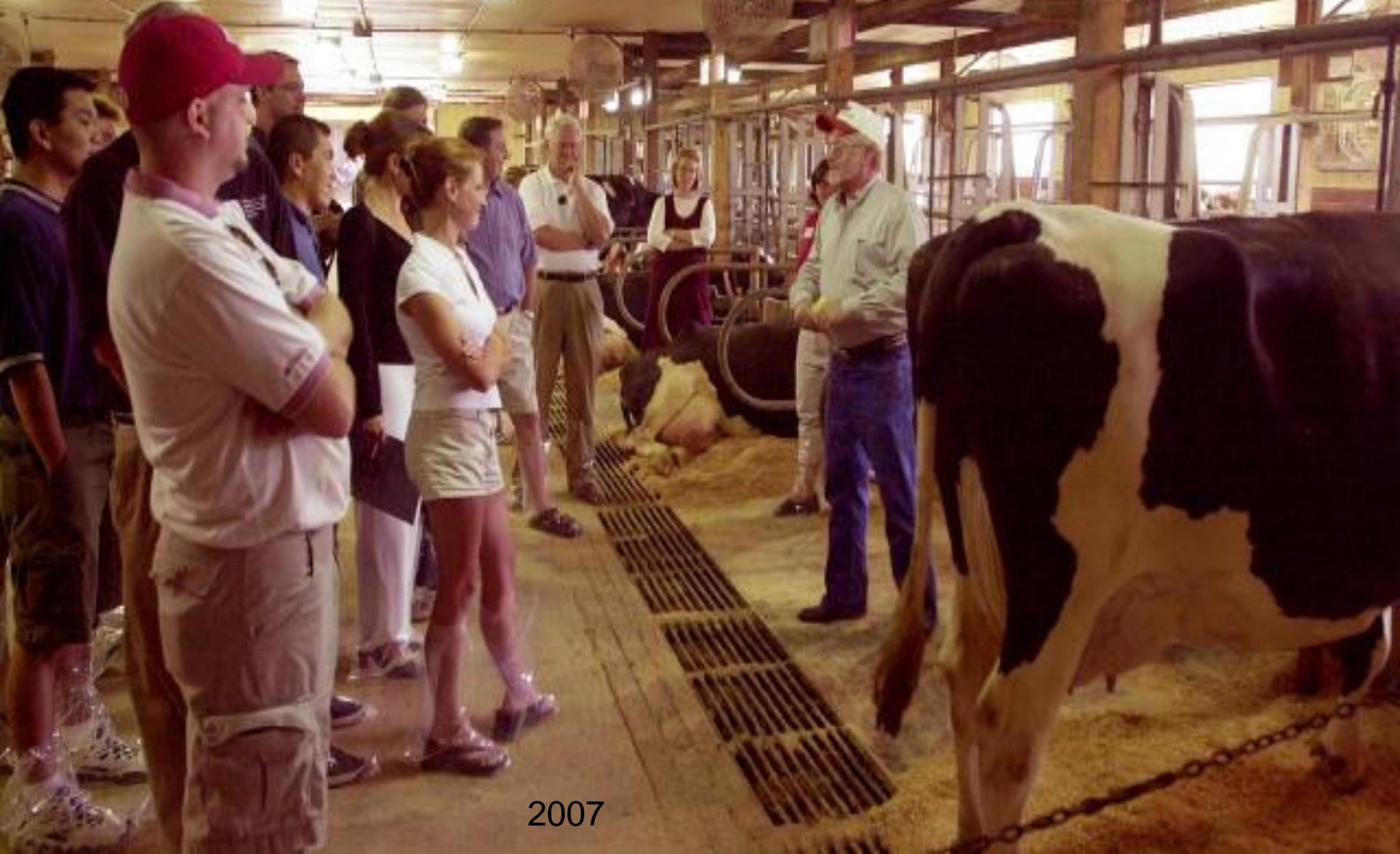
2007



2007

Agriculture Conference

Dairy Conference



2007

2007

Showing at the State Fair





2007

2007

Ag Day at the University



Buy Ohio Day



1960
2007

Volunteerism

2007



2007



Judging Pigs

2007

Food Pyramid



American Agriculture - Crops by Professor Ockerman & Lopa Basu

From
The Ohio State University
<http://photolib.ag.ohio-state.edu/>

USDA
<http://www.ars.usda.gov/is/graphics/photos/>



**Diesel + Biodiesel –
from Soybeans**

2007

A close-up view of a tractor's rear wheel and a red plow. The plow is labeled "WHITE" and "802". The tractor is plowing dark, moist soil in a field. In the background, there are trees and a clear sky.

2007

Plowing

Contour Cropping

2007



Spraying Soybeans for Corn Root Worm

2007



Soybean
ready for
harvest

2007



Mature Soybean

2007

A close-up photograph of a field of green wheat plants. The plants are tall and slender, with numerous small, light-green leaves at the top. They are densely packed, creating a textured, vertical pattern across the frame.

wheat

2007

Wheat

2007



Wheat



2007

2007

Bread



2007

Corn



A photograph of a corn field. The field is divided into several parallel rows of green corn plants. In the foreground, there is a distinct path or row where the corn has been harvested, leaving behind brown, dried stalks. The lighting suggests it might be late afternoon or early morning.

Corn Field

2007



Immature Corn

2007

Corn Harvest



2007



Shelled Corn Harvest

2007

Loading Corn

2007



An aerial photograph of a rural landscape showing a large field of harvested crops. In the foreground, a green tractor with a yellow cab and a green grain cart is moving towards the left. Behind it, a blue tractor with a red grain cart follows. Further back, a green tractor with a green grain cart is followed by a red tractor with a red grain cart. To the right, a long line of tractors and grain carts extends across the field. A small group of people is standing near the bottom center. The sky is clear and blue.

2007

Grain Train



Corn Storage

2007

Sweet Corn

2007

Sweet Corn

2007

2007

Wheat





wheat

2007

Potatoes

2007

Pumpkin





Strawberries

2007



Strawberry Harvest



Apple and Pear

2007



Apple

2007

A close-up photograph of two ripe pears hanging from a tree branch. The pears are yellow with red blush and are attached to a brown, textured branch. The background is filled with green leaves.

Pear

2007

Tomatoes



2007

2007

Picking tomatoes



2007

Greens





sugar
Beets

2007



Center Pivot Irrigation

2007

Watershed Management

An aerial photograph showing a vast landscape of agricultural fields in various stages of cultivation. The fields are organized into long, narrow plots that follow the contours of the land. In the background, a small town with numerous houses and buildings is visible, nestled among the fields. The overall scene depicts a rural area where agriculture is the primary industry.

2007

Cranberry Harvest

2007





Cotton Stalk Puller

2007

A photograph showing a large red cotton harvester in a field. The harvester is positioned on the left, facing right, with its mechanical arms extended over a massive, sprawling pile of harvested cotton bales. The bales are white and fluffy, filling the lower half of the frame. In the background, more cotton fields stretch towards a clear blue sky.

Cotton
Harvested

2007

A close-up photograph of a cotton plant. Two large, fluffy white cotton bolls are the central focus. The bolls are surrounded by dark green, heart-shaped leaves. In the background, two vertical orange poles are visible, likely part of a trellis or support system.

**Cotton
Ginned**

2007

Composting



2007