



July 14-16, 2014
103rd Annual Meeting of the Poultry Science Association
Corpus Christi, Texas

Sponsored by:



*“The Role of the Poultry Industry in Feeding the World in 2050”
Symposium*

Closing the Gap Between Commercial Performance and Healthy Potential



Dr. Christine Daugherty

Chief Technology Officer

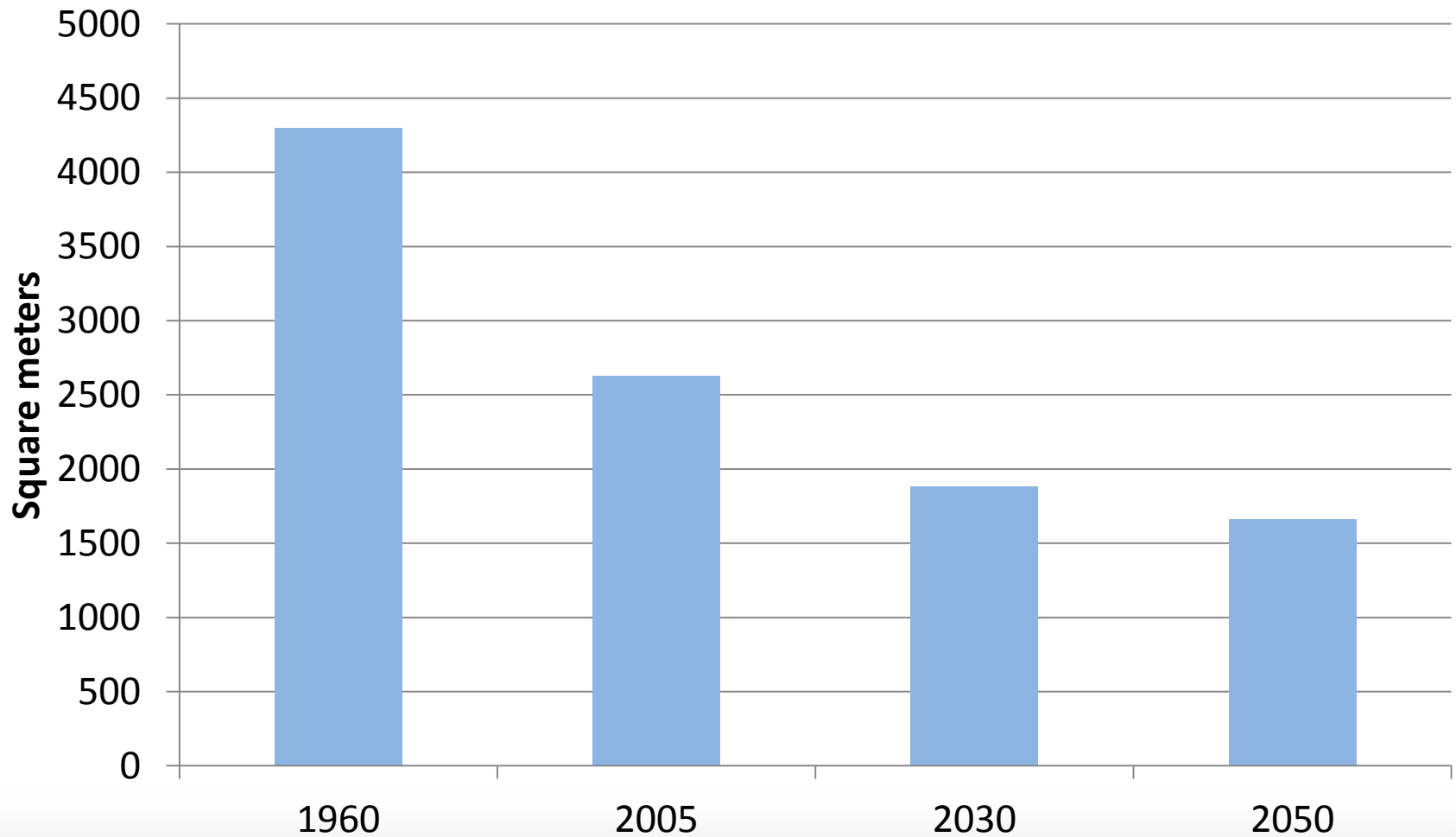
PSA Symposium: Feeding the World in 2050 The Role of the Poultry Industry

July 2014

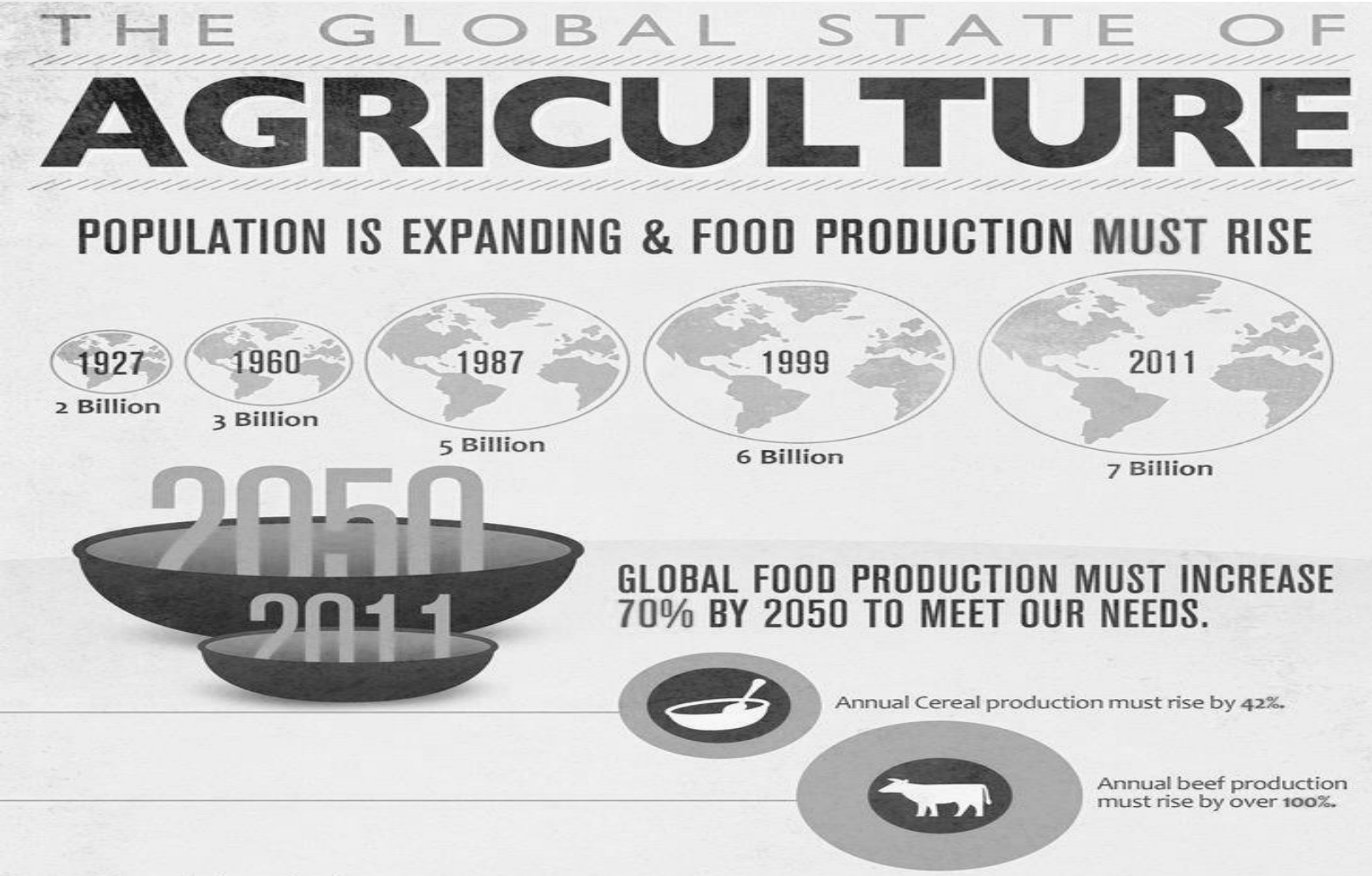


Picture provided by NYTimes

Arable Land per Capita



Meeting Food Demand



Source: <http://50.usaid.gov/infographic-the-global-state-of-agriculture/usaid-agriculture-1000/?size=infographicMedium>

Currently Over 7 Billion People



W1
Affluent/industrial

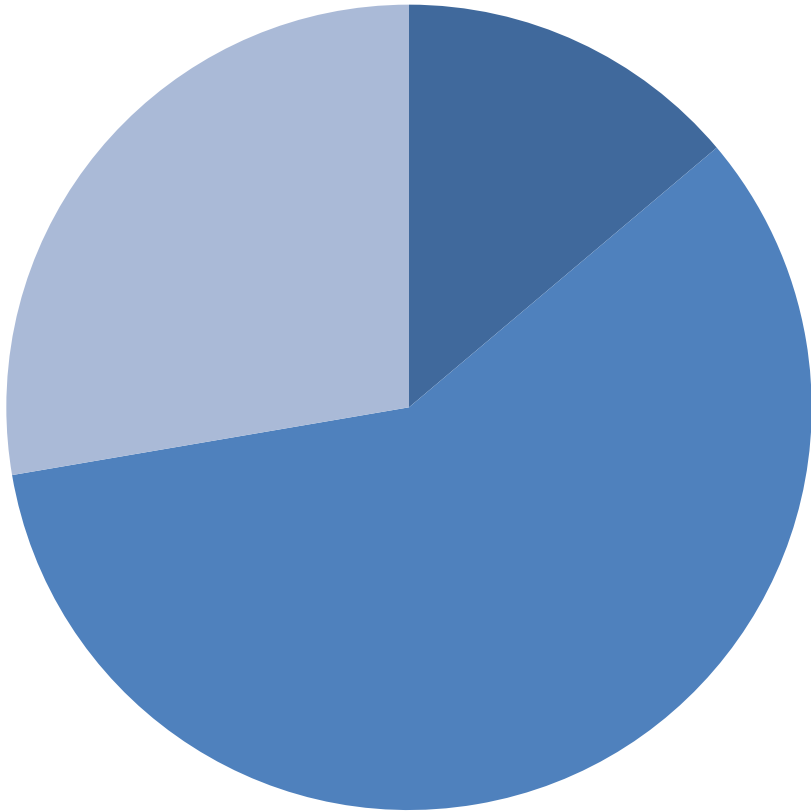
■ W1

W2
Emerging (BRIC)

■ W2

W3
Impoverished

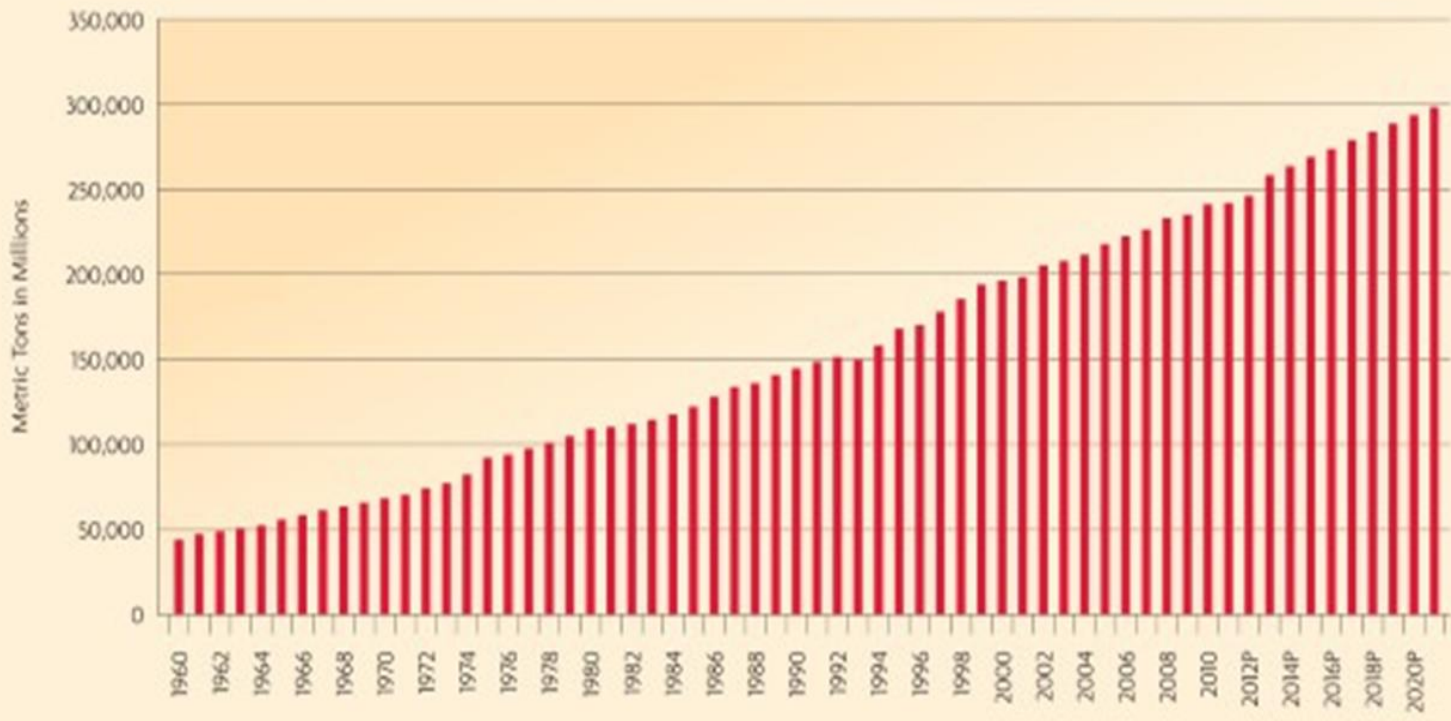
■ W3



Increase in Global Protein Consumption



GLOBAL PROTEIN CONSUMPTION



The world is eating more protein. Over the past 60 years, global protein consumption has grown by more than 450%.

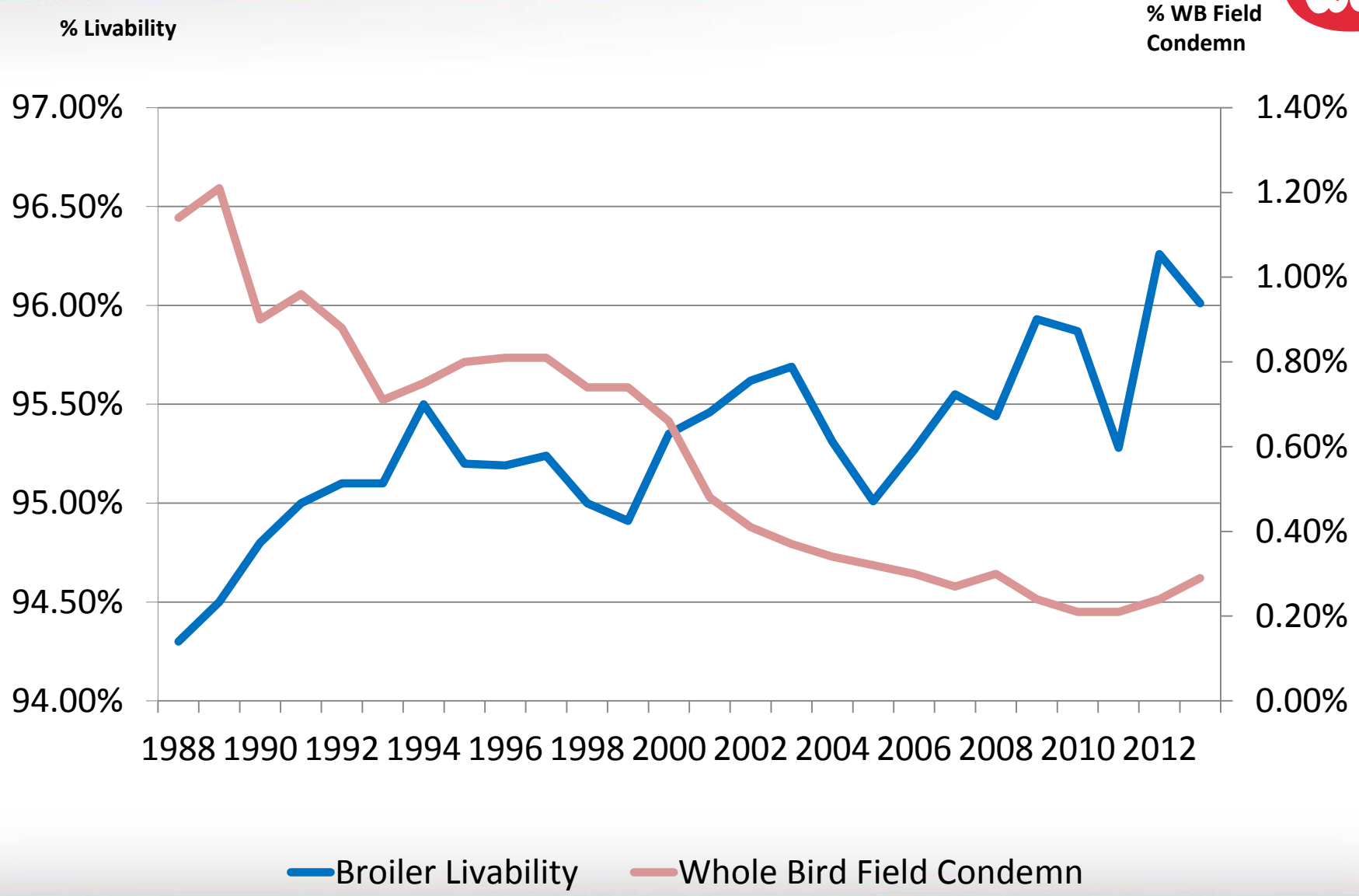
Source: USDA FAS and OECD. Includes Beef, Veal, Pork, Broilers and Turkey



*Can the Poultry Industry
Meet the Future Demand
for Protein?*



% Broiler Livability & Condemnation 1988-2013

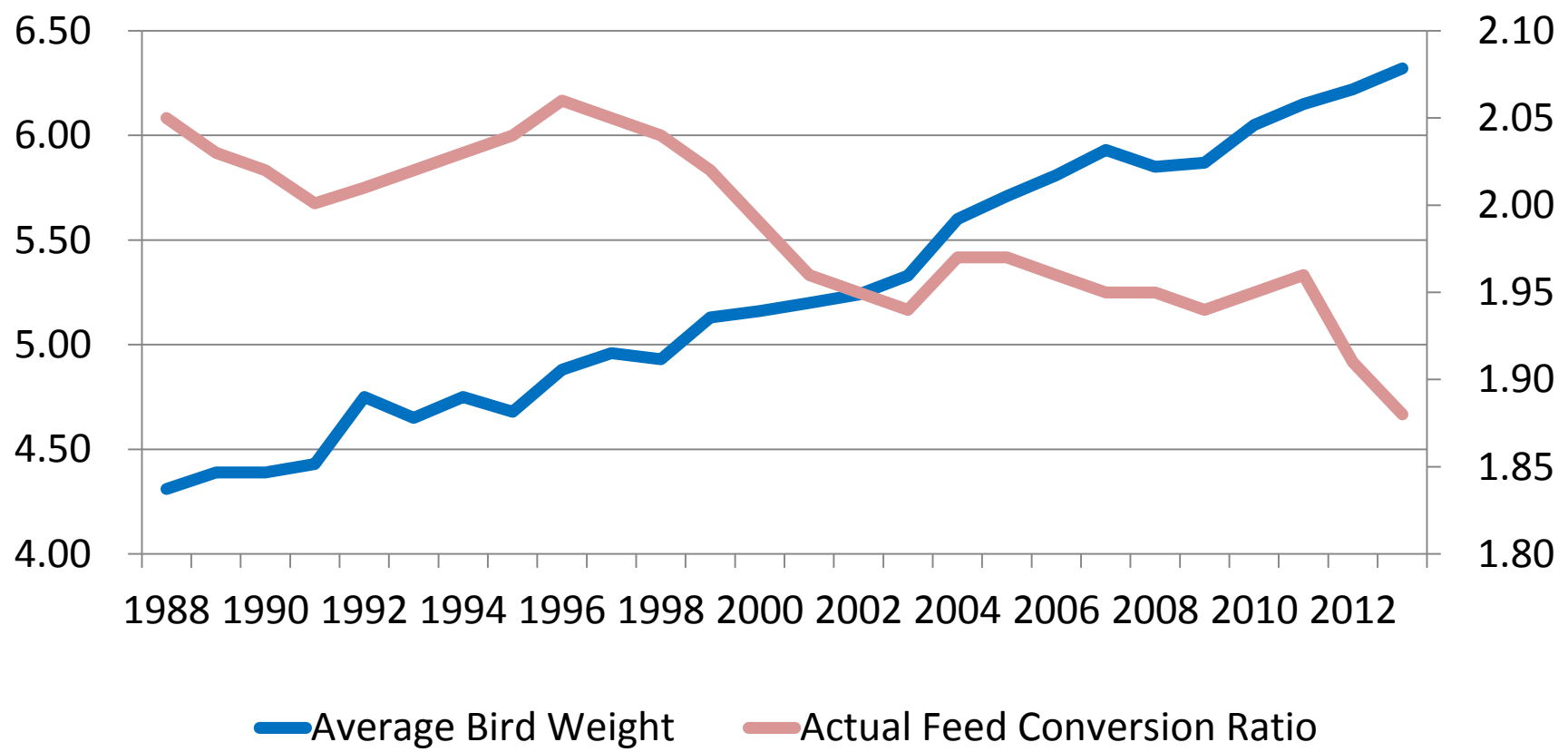


Historical Look at Feed Cost



	1999	2008	2013
Feed Cost	12.33	23.62	34.88
Live Cost	23.91	35.49	48.43
Feed Cost as a % of Live Cost	51.6%	66.6%	72%

Average Live Weight U.S. Broiler Industry vs. Actual Feed Conversion Ratio 1988 through 2013



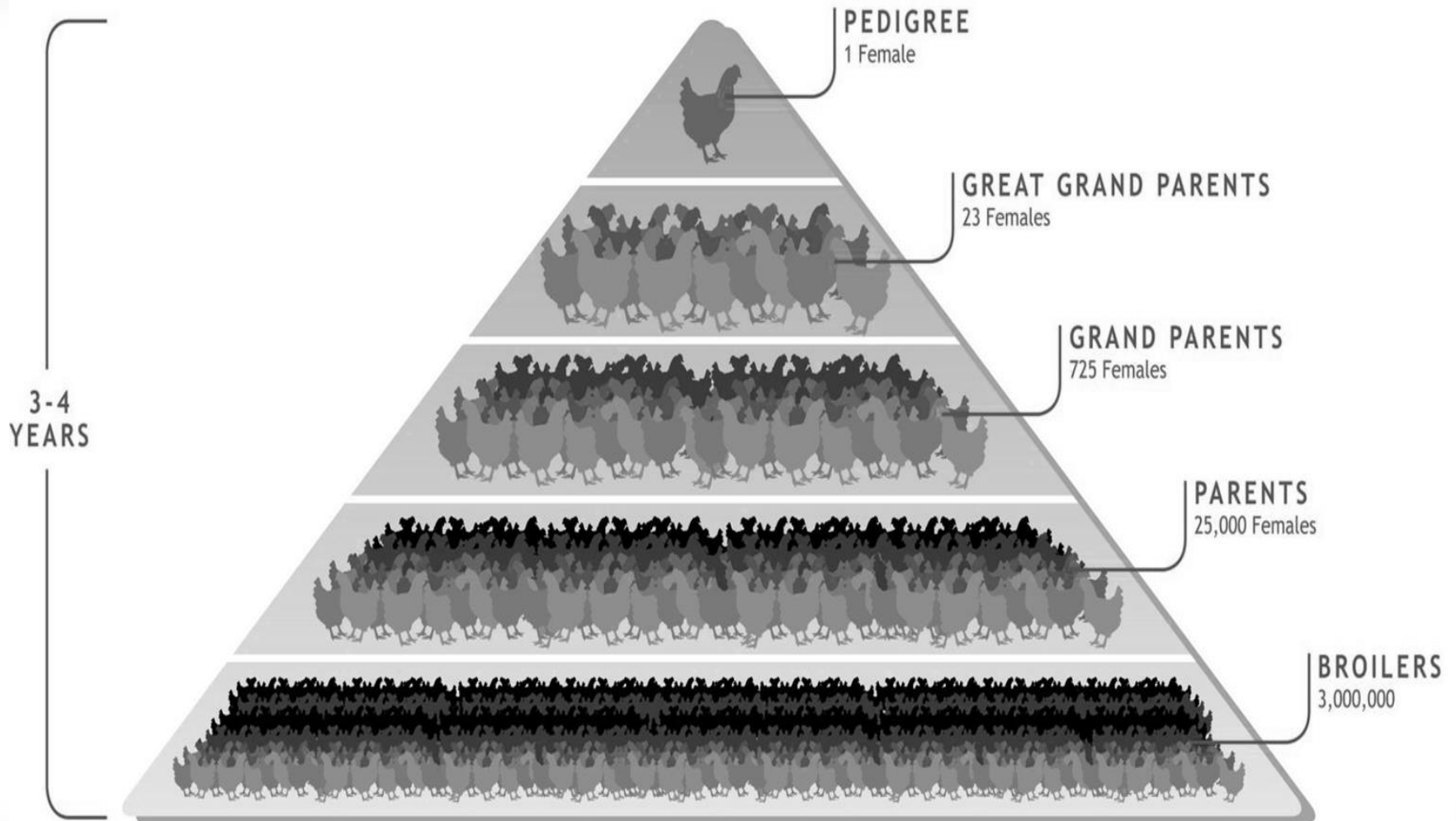
Can the Poultry Industry Meet the Future Demand for Protein?



- FAO estimates 1.8% growth in poultry meat consumption from 2007 to 2050.
- Current world market for commercial broiler breeders is estimated near 450M breeders.
- A 1.8% expansion from 2014 to 2050 would require about 1.9 times more breeders or 855M breeders.



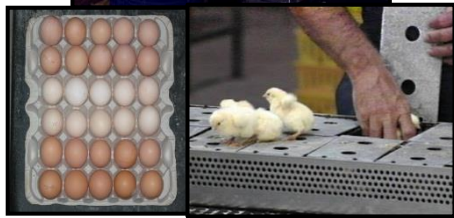
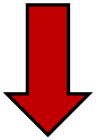
Pedigree to Commercial



The Evolution of Breeding



1950's

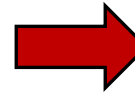


1960's & 70's

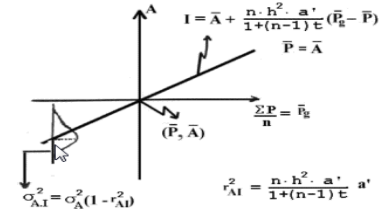
$$P = \mu + A_m + \chi\sqrt{\sigma_E^2 + A_v}$$



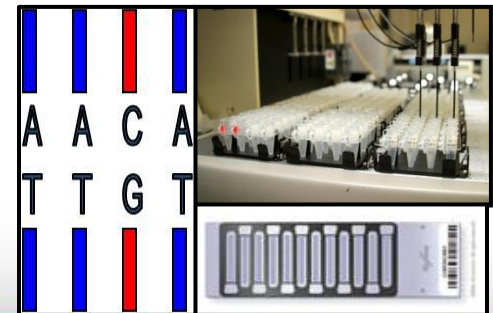
1970's & 80's



1990's +



Today + Future



Selection must be Balanced



Growth and Efficiency traits

Production, Welfare and Environmental Traits

- Improved robustness with better livability
- Improved broiler skeletal and leg health
- Enhanced heart and lung efficiency
- Improved growth, feed conversion and total yields
- Improved egg production and hatchability



Phenotypic Measurements



Feed Conversion



Foot Pad Dermatitis



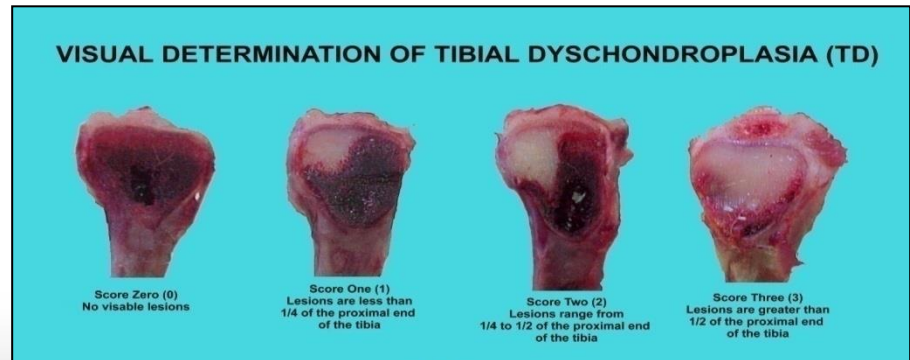
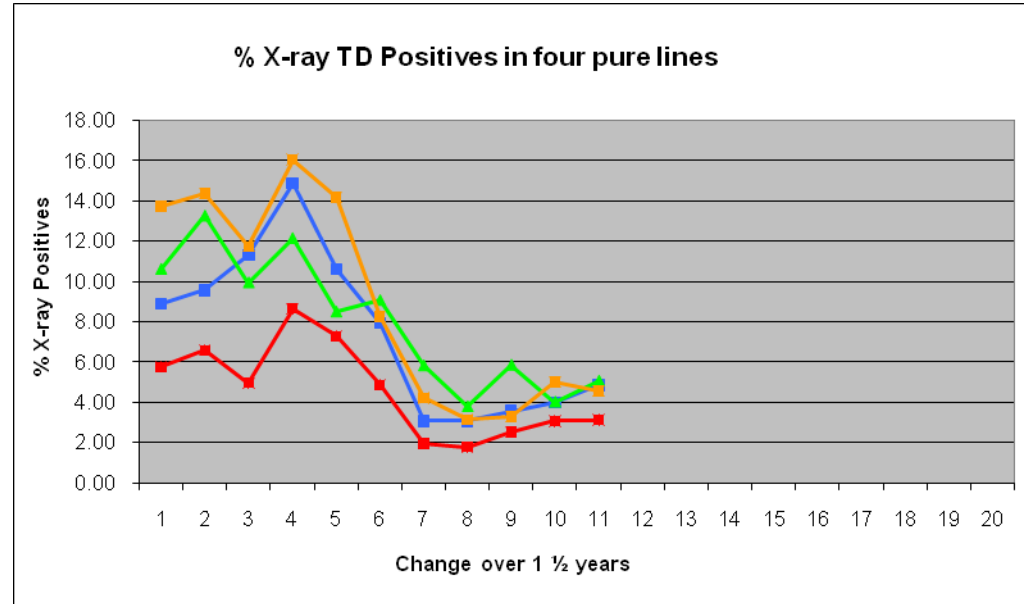
Ultrasound



Gait Scoring



Improving Leg Health



Improving body posture and walking ability

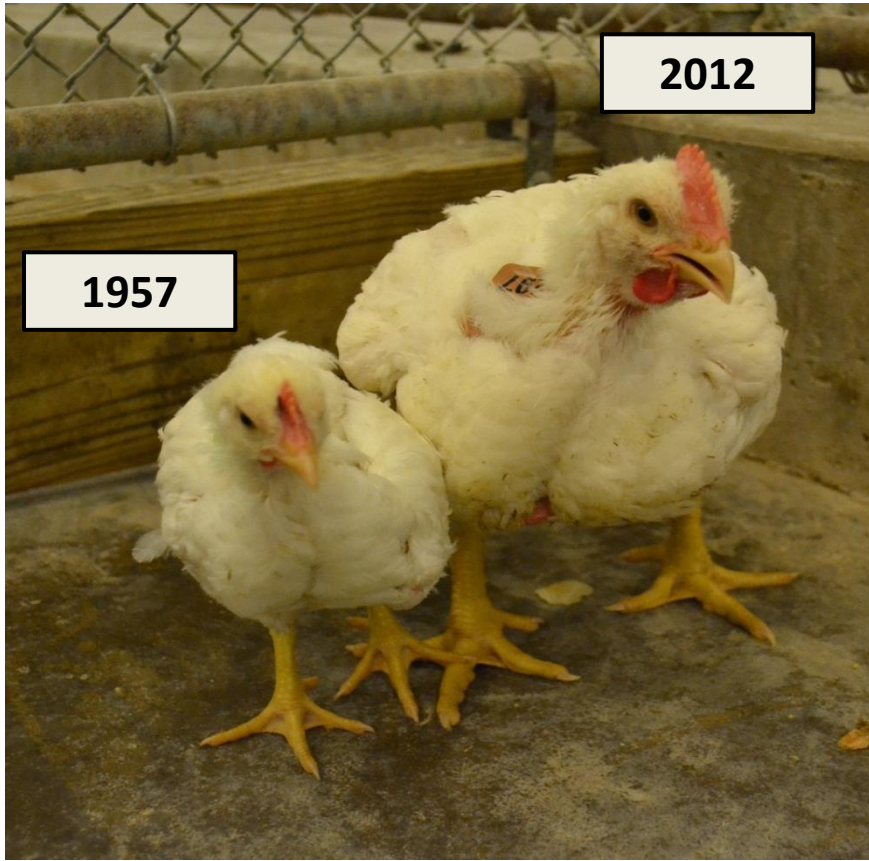


- How do chickens stand and move?
- How does anatomy influence stance and gait?
- How can a balance between muscle mass and gait be achieved?
- How can bird walking be improved by selection?



Researchers: Heather Paxton, Sandra Corr and John Hutchinson at The Royal Veterinary College, University of London

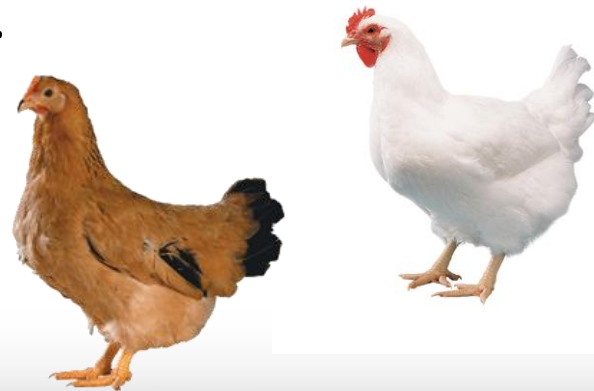
Broiler Evolution 42 Days (2.5kg)



Genetic Diversity for the Future



- Access genetic diversity with unique genetics. For example, poultry lines for greater egg production, dwarf, heat resistant, and colored lines.
- New parent and broiler crosses are continuously made and tested. These lines are derived from unique gene pools using traditional and genomic selection.
- In addition, new technologies for biobanking and genome preservation are being developed.

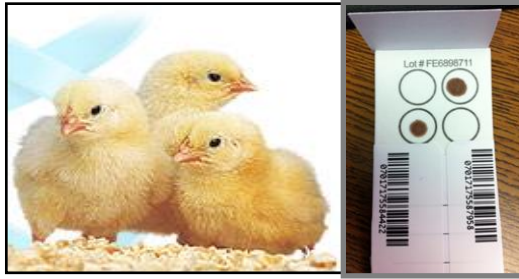


Why use Genomic Selection?



- Large number of animals produced
- Most birds have own phenotypic records
- Genomic Selection data indicate a ~20% improvement in predictability of phenotype for traditional traits
- Major benefit for traits that are difficult to measure
- Genomic selection using DNA Panels can be used to screen for mutations and resistance/tolerance to disease
- Maintaining genetic diversity / assessment of inbreeding
- Parentage testing

Sample Collection

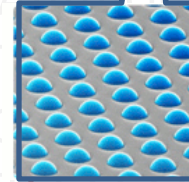


DNA typing

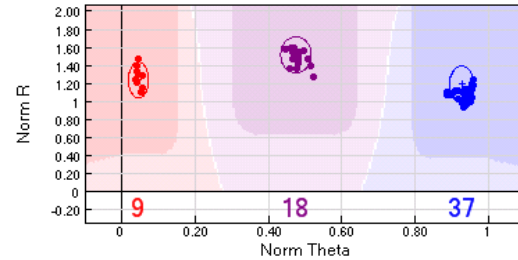
Selection of breeding stock prior to its first breeding opportunity



Increased accuracy of Breeding Values and Elimination of bad genetics



DNA analyses





YES.
*The Poultry Industry
can meet the future
demand for protein.*



Balancing for Success



- Economics**
- Efficient
 - Low cost
 - High yielding
 - Profitable

- Environment**
- Reduced inputs
 - Reduced output
 - Efficient growth
 - Improved carbon footprint

- Welfare Invested**
- Welfare & Ethics**
- Compassionate
 - Health oriented
 - Research focused

If you can't feed 100 people, feed just one.

Mother Teresa



One Egg | Rwanda



- Half of the children in Rwanda are **chronically malnourished**
- Before the One Egg program, the people of Rwanda had barely any protein in their diets
- Children now receive **one** hard-boiled egg per day, **five** days a week
- Rwandans are learning how to manage the farms and source their own food
- One Egg has had a **positive long term impact** that will benefit the community year after year

One Egg | Rwanda



- One Egg Rwanda began in 2011 and is now responsible for providing eggs to over **1,500** children
- Eggs are now being delivered to **18** different child development centers in the Northern Province of Rwanda



