

## The Economics of Broiler Production

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# **50 -70 -90**

- •According to FAO, In the year 2050...
- The World will need to produce 70% more food
- 90% of which will come from Technology that enables yields to be increased



Food and Agriculture Organization of the United Nations

for a world without hunger

### Intensive Poultry production will play a key role in meeting these objectives!

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#### Macroeconomics – Trends in The World of Poultry

The Good News: Growth The Bad News: Challenges Importers and Exporters A World of Different Markets



#### Microeconomics

Business Models: Integration vs. Non-Integration Performance vs. Efficiency vs. Cost Key Costs for the Poultry Company Key Cost Factors and their drivers Relative Importance of all KPI's Value



#### Putting it all together

Keys for a successful Poultry Company

#### The World of Poultry The Good News – Increase in Demand





#### Significant growth is predicted in Iran

#### The World of Poultry The Good News – Population Growth, GDP



#### The World population continues to grow

6 billion in 1999, 7 Billion in 2011, 11 Billion projected for 2050

## Most of the population growth will take place in developing countries (Asia and Africa)

Today China and India already represent 40% of the population Asia will account for five billion people Africa for four billion people

#### **Developing countries have high GDP**

- China, India = 7-9% GDP
- Higher buying power means increase in meat consumption

- In many countries chicken consumption Is very low (0.5-2kg/annum), potential is enormous





### The World of Poultry

#### The Good News – Poultry is Most Efficient



- This not only means less feed usage
- It also means less waste, more environmentally friendly



### The World of Poultry



The Good News – What have the breeding companies done?

- Globally approximately 60 billion broilers produced per year
- In the last ten years feed conversion has improved by 0.145 points, mean.....



Source: USDA Agricultural Projections to 2019, February 2010. Economic Research Service, USDA.

- 17.4 Million tonnes less feed now required or
- 9.57 million tonnes less wheat/corn or
- 2.66 million fewer acres required

#### The World of Poultry The Bad news: Challenges





#### The World of Poultry The Bad news: High Feed Prices









### The World of Poultry The Bad news: Volatile Feed Prices



- Housing, transportation, raw materials, utilities, etc.
- Feed
  - Feed costs as a % of live costs have gone from the low 50% range to the 60 - 70% range in the past 7 years.
- Competition for hectares around the world
- Demand is going up!
  - Growing population
  - China Syndrome
  - Severe Weather conditions
  - Bio Fuel demand
- Grain prices high with increasing volatility
- The GM vs. Non-GM debate





### The World of Poultry The Bad news: Soyabean



- Main price drops in vegetable oil prices which had moved well above value in bio diesel.
- Fundamentals are showing tight S&D and the need for more soya bean acres
- US plantings est. 71.8 million acres this spring, up from 63.6 million year ago
- Need also increase in Brazil and Argentina plantings
- Non GM soyabean meal supplies still tight in the spot position, however many producers finding ways of replacing with GM material



### The World of Poultry The Bad news: Soyabean

Cobb

- Price differentials GM Soya vs. Non GM
  - yields, contaminations premium at US\$ 40 per ton and increasing to US\$80 per ton
- Possibly a big issue in 4-5years when availability of NON-GM material will be very limited
- EU takes minimum of 30 months to approve new GM varieties
- US, Japan, Canada, China takes 15 months



#### The World of Poultry The Bad news: Energy prices





Unpredictable and driven by politics and supply as well as demand



### The World of Poultry

The Bad news: Supply and Demand Imbalances

- Production imbalances and Pricing
  - The circle of Death
  - In developing countries circle is stopped by producers "talking" and controlling production
  - Difficult to stop in many developed countries (EU): It is illegal for competitors to control pricing



- Political Unrest and Notifiable Diseases can create supply imbalances
  - War In Libya: NL, Spain and France had excess HE production and the prices dropped from €0.25 to €0.15-now shortages!!!
  - War in Iraq: and prices increasing



### The World of Poultry

The Bad news: Supply and Demand Imbalances



#### Political Unrest and Notifiable Diseases can create supply imbalances

- War In Libya: NL, Spain and France had excess HE production and the prices dropped from €0.25 to €0.15-Then shortages!!!
- War in Iraq: and HE prices increasing from €0.24 to €0.38!!!!!!!!!



#### **The World of Poultry** Global Market Positioning in 2020





- China (60 bn \$, 2011) and India investing in Argentina, Brazil and Africa to ensure food supply. China imports 22% of the World's soya prod. (USDA, supply & demand report, 2011)
- Middle East is also trying but resources are limited. Become biggest importer in the World

### The World of Poultry

How countries can protect their industry?



In high cost markets where there is not population growth:

- Some ban imports....others try to compete....
- E.U. promotes fresh, local food as Healthier, Safer and Environmentally better...
- Marketing: Increase market share over other meats (Pork, Beef) (per capita consumption: Germany 12kg/pa)







### A World of different Markets – LIVE



#### Why do they still exist? Best way to ensure freshness when no electricity or cold chain. Cultural





## A World of different Markets - WHOLE





#### The World of Poultry

### A World of different Markets – Mixed Frozen vs. Fresh





#### The World of Poultry

### A World of different Markets – Deboning and Further Processing





#### The World of Poultry A World of different Market - Dark Meat vs. White Meat Markets



Price per Kg from Slaughterhouse	UK	Turkey	
Deboned Breast Meat	€ 4.35	€ 2.05	
Leg Quarters	€ 1.45	€ 2.02	

Because of the import bans in Russia on US dark meat (Bush legs)-cold stores in the US are filling up with dark meatthis will create market imbalances and will eventually drive down the price of breast meat in the US

## Raw material competition & Feed cost implications



**Continued Commitment to Feed Efficiency** 

An Incredible success story! – almost 250% improvement since 1957 The bird of today converts feed better and has adapted to changing feed quality trends



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Source: CVI

Raw material competition & Feed cost implications Continued Commitment to Feed Efficiency

One trait that a breeding company can not afford to stop selecting for.

 The bird of the future must be able to perform with low cost feed and accept feedstuff of lower quality (by-products)

YEAR

2.00

1.95 1.90

1.85

1.80 1.75 1.70

1.65 1.60 1.55

1981

FCR

Genetically, FCR has been declining linearly (2 points/year) Benefit in Feed Cost reduction is approx \$9m pa over past 20 years based on 1m BPW kill @ 2.2kgs ALM





#### Sustainability of Continual Rate of Genetic Improvement Develop New Selection Technologies

#### **Digital X-Ray**



#### Ultrasound



#### **Meat Quality Testing**



**Blood O2 Testing** 



### Genetic Selection Complexity Growing Role of Biotechnology



- Gene Marker Assisted Selection to make progress on difficult traits that can't be selected on phenotypic traits and increase selection accuracy
  - Genomics
- Look at the possibility of safeguarding food
  - Salmonella resistant meat ?
  - AI resistant genetic chicken lines ?
- Making poultry meat more healthy
  - Add more nutrients (calcium, omega 3 fatty acid
- Ensure Consumer Acceptance
  - Focus on positives
    - Al resistance, salmonella resistance
  - Not on biotech evils
    - GMO, cloning, transgenics



#### Sustainability of Continual Rate of Genetic Improvement Genomics – Applications & Cobb Research

- Increased accuracy of selection (use genotype)
  - Growth, Feed Conversion and Yield Related Genes
  - Meat Quality
  - Ascites
  - Tibial Dischondroplasya
- Select for **sex-limited traits** (male egg production)
- Select for traits of low heritability
  - Fertility
- Selection for **difficult to measure traits (disease)**:
  - Avian Influenza Resistance
  - Marek's Disease Resistance
- Predict heterosis between crosses (egg production)
- Paternity and Product/ Line identifications Traceability





Sustainability of Continual Rate of Genetic Improvement **Continued increase in selection accuracy** 





2.75

2.50

2.00

1.75

**ॐ** 2.25

Allows continued progress in **broiler** performance. Weight continues to increase while broiler mortality decreases every

Allows continued progress in breeder performance. Eggs continue to increase while breeder mortality decreases every year



(Agri Stats Annual Reports – (1988 to 2006)

Live Wt. (Kg) — Mortality

#### **Microeconomics**

#### **Different Business Models**

#### **Non Integration**

## Every segment: Breeders, Hatchery, Feed, Broilers and Processing owned independently

- Performance usually good: Competitiveness
- OK if choice of supply is at a reasonable distance (NL)
- Complexity and loss of value in the supply chain (i.e. High yield birds wanted by processors but not liked by farmers)

#### **Vertical Integration / Contracts**

#### All segments under one management/ownership

- Clear planning and direction Market ownership
- Easier to capture value, margin control
- Economies of scale and optimization of capital resources
- Risk of complacency/ lower motivation and performance













### Microeconomics Performance vs. Efficiency vs. Cost



ADG – Average Daily Gain Total Eggs Produced/ HH

Efficiency Indicators: Measure use of resources required to maximise production. Efficient = No additional output can be obtained without increasing inputs. FCR – Feed required to produce 1kg of weight

Hatchability: Eggs required to produce one chick



#### **Cost Indicators:** Value of Money used in the process Feed Cost/kg live – Includes Performance, FCR and Diet Cost Chick Cost – includes Total Eggs, Hatchability and Feed Costs



### Microeconomics Key Costs for the Poultry Company



- Hatching Egg Cost
- Hatchery Cost
- Broiler Chick Cost
- Total Broiler Live Cost/ kg
- Processing Costs/ kg
- Processed Meat Cost/ kg

## Microeconomics Key Costs – Hatching Egg Cost



Factor	Cost /H. Egg	%
Adult Breeder Feed	€ 0.0771	37.9
Pullet Amortization w. Feed (w/o chick)	€ 0.0499	24.5
Labour + Supervision + Services	€ 0.0360	17.7
Day Old Breeder Chick (Package)	€ 0.0210	10.3
Utilities + Maintenance	€ 0.0101	4.9
Medication and Vaccine	€ 0.0005	0.2
Miscellaneous	€ 0.0090	4.4
Total	€0.2035	



## Microeconomics Key Costs – Broiler Chick Cost



Factor	Cost per Chick	%
Egg Cost	€ 0.2035	71.1
Hatchery Costs	€ 0.0389	13.6
Transportation (Eggs and Chicks)	€ 0.0286	10.0
Chick Service	€ 0.0142	5.0
Miscellaneous	€ 0.0012	0.4
Total	€0.2864	



## Microeconomics Key Costs – Broiler Live Cost



Factor	Cost/kg Live	%
Feed	€ 0.5874	66.8
Chick	€ 0.1432	16.3
Farm Rental and Maintenance	€ 0.0810	9.2
Catching and Transport	€ 0.0327	3.7
Utilities	€ 0.0286	3.3
Medication and Vaccine	€ 0.0061	0.7
Miscellaneous	€ 0.0015	0.2
Total	€0.8791	



## Microeconomics Key Costs – Broiler Live Cost



Source: van Horne, LEI report 2009-004 (AVEC 2010 annual report)

#### Brazil and US are 60% cheaper than Europe





## Microeconomics Key Costs – Integration



Factor	Cost/ Kg Processed	%
Broiler Live Cost	€ 1.204	79.9
Whole Bird Processed Costs (incl. Transport)	€ 0.225	
Cut Up Processing Costs	€ 0.375	
<i>Total (50% Cut up + 50% Further Processing)</i>	€1.507	

### Microeconomics Key Drivers of Chick Cost



Factor	Key Drivers
Chick Cost (€)	Egg Production - Pullet Body Condition Uniformity - Light Stimulation - Feeding for production - Controlling Female Mortality Hatchability/ Hatchery Costs - Male Management, - Egg Age, Stocking Density, Hatchery Temp., Egg Quality Feed Consumed/ Chick Egg Production, Peak Feed, Feed Reduction post peak

### The efficiency of Breeder production Key Efficiency Indicators



Numbers 60 weeks	to	Total Eggs	HE 9 (*	/TE % 1)	Hatching Eggs/ HH	Hatch % (2)	Chi	cks	Hatchery Co per chick ( cents) (3)	osts (€
Breed R		169.2	95	5.0	160.7	79.7	12	8.1	3.80	
Cobb 500		161.3	96	6.7	153.0	84.2	12	8.8	3.67	
	Nur 60 v	mbers to weeks		<b>Co</b> f (0-6	Feed nsumed/ emale 50 wk) Kg	Feed Consum Chick (g)	ed/ ( <b>4)</b>	C	Chick Cost (€ cents) (5)	
	Bre	ed R			56.0	437			29.1	
	Col	bb 500			54.5	423			28.0	

### Microeconomics Key Drivers of Broiler Live Cost/kg



Factor	Key Drivers
Live Cost/ Kg (€)	Feed Cost/kg -Diet Cost - FCR and Mortality Control: Diet, Brooding, Environment control, Vaccination, Disease Control

Numbers to 38 days	Weight (g)	FCR	EPEF	Cost of Feed <b>(€/Ton)</b>	Cost/ Kg Live (€ cents) (1)
Broiler A	2180	1.77	307	330	85.9
Cobb 500	2140	1.78	299	324	85.4

500,000 broilers wk x 52 wks x 2.0kg x €0.005 = €279,500 saved /year

### Microeconomics Key Drivers of Cost/Kg Meat



Factor	Key Drivers
Cost/ Kg Meat (€)	Live Cost/kg Processing Yields Diet Control of Farm Rejects - Mortality - Catching procedures and equipment Weight loss during transport Control of Plant Rejects/ Meat Quality - Killing - Stunning - Plucking





In North America and South America the Cobb breed is number one (over 70% of Market share) because of the economics of yield

#### **Microeconomics**

#### Understanding KPI trade off's



Parameter	Value		Value
1 Total egg	1	1% Broiler Mortality	3.0
1 Day Less Broiler (ADG)	1.1	1% CV Uniformity	3.0
1 Chick	1.3	€1 Less per Ton of Feed	4.2
1% Female Mortality	1.6	1 Point FCR	4.5
1% Hatching/ Total Egg	1.8	1% Carcass Yield	10.0
1 Kg Less Female Feed	2.0	1% Breast Meat Yield	37.0
1% Hatch	3.0		

#### Regardless of pure economics, there are "acceptable" minimum PI levels. © 2015 Cobb Europe - Confidential & Proprietary

#### **Economic Model Summary - Cobb500**

For a company producing **1,000,000 broilers/week** 



Business	CobbComp.Costs (€ cents)		Main Reasons for difference	Margin / Cost Saving to Cobb 500 per year
Broiler Hatching Eggs	0.224	0.221	8 Hatching Eggs less, but better hatch makes them more saleable	
Broiler Chick Costs	0.271 0.280		3% Better hatch, >1.8kg less feed per female	
Broiler Live Costs (per Kg)	0.867	0.867	Cheaper Feed Costs/kg	
Processing Costs/ Margin (per Kg)	1.547	1.551	1% More yield, better uniformity	
	•		Cost Saving	€ 538,476
Full Integration			Margin if Extra Meat is sold	€ 2,156,891
			Average Additional margin	€ 1,347,683

## Microeconomics Value is only real if...



#### • It can be measured/ captured

–Example: 50% of the broilers in Spain are sold WHOLE with 2.7kg to the Supermarket. Cut up by Supermarket's who cannot measure 0.5% more breast meat yield

#### • Somebody is willing to pay for it

-Example: In Turkey 1% breast meat yield has half the value than in the UK, because people prefer dark meat

#### **Putting it all together**

#### Key's for a Successful Poultry Company





Tyson an 45 billion/annum food company

Nan-Dirk Mulder – Rabobank

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## Thank You



