

STORM FORECASTS

the only source of independent animal health & animal agriculture 10-year forecasts driven by a robust global model

- STORM FORECASTS delivers 10-year animal health, animal agriculture and macro-economic forecasts for 57 countries / regions, including developed and emerging markets
- STORM FORECASTS covers food animals (cattle, sheep / goats, pigs, poultry, aquaculture) and companion animals
- STORM FORECASTS delivers animal protein consumption, production and trade forecasts
- STORM FORECASTS delivers production animal population forecasts
- STORM FORECASTS is updated by experts in animal health, agricultural economics and market modelling

Vetnosis - Who We Are



Vetnosis is a leading research and consulting firm specialising in global animal health and veterinary medicine.

We were formed in January 2008 through a MBO of Wood Mackenzie's animal health business.

Our first research was published in 1986 and we celebrate 25 years of animal health sector research and consulting this year.

We deliver independent and insightful information and advice to animal health companies, financial services firms and other stakeholders through our research products and consulting services.

STORM FORECASTS is a data-rich research tool delivering 10-year animal health, animal agriculture and macro-economic FORECASTS for 57 countries / regions

➤ All Species

- Food Animals
- Companion Animals

➤ Coverage

- Global
- Regions
- Sub-regions
- Countries

➤ Content

- Animal Health Market forecasts
- Animal Agriculture forecasts
- Macro-economic forecasts

➤ 10-year Forecasts

➤ Updated annually since 2008

STORM FORECASTS: 2011-20 Dataset

Country: Global
Species: All
Release date: 1st July 2011

	Summary Tables & Charts	Data	
Macro-economics	Macro-economic Summary	Macro-economic Data	Country Key
Production	Production Summary	Production Data	
Animal Feeds	Animal Feeds Summary	Animal Feeds Data	
Consumption	Consumption Summary	Consumption Data	Data Key
Balance Sheet	Balance Sheet Summary	Balance Sheet Data	Glossary & Sources
Animal Balance Sheet	Animal Balance Sheet Summary	Animal Balance Sheet Data	
Treatment Units	Treatment Units Summary	Treatment Unit Data	
Animal Health Nominal	Animal Health Nominal Summary	Animal Health Nominal Data	
Animal Health Real	Animal Health Real Summary	Animal Health Real Data	
Animal Health FX Neutral	Animal Health FX Neutral Summary	Animal Health FX Neutral Data	

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Background to STORM FORECASTS

- Isolated “bottom-up” forecasting by country market is fundamentally flawed due to increasing globalization of animal protein production and trade
- Increasing market complexities demand global forecasting tools that used sophisticated market simulation and demand forecasting methodologies
- Local managers must understand complexities of global animal protein supply and demand
- Emerging market opportunities need to be quantified based on market fundamentals
- Large variations in healthcare spend amplifies impact of globalizing animal protein production
- Need to forecast where animals will be raised in future and under what production systems

STORM FORECASTS deliver competitive advantage

- **Companies operate in an increasingly complex, dynamic & competitive market**
- **Anticipating future needs and demand and identifying risks and opportunities are critical success factors but are amongst the greatest challenges**
- **Identifying future trends will determine who succeeds and who fails**

External Challenges

- Consumer dynamics changing faster than ability to respond
- Accelerating changes in global supply and demand
- Animal agriculture dynamically evolving
 - Consumer needs and demand
 - Regulation, policy and politics
 - Disease and production dynamics
 - Technology
- Macro-economic dynamics

Internal Challenges

- Companies no longer employ agricultural economists and market modellers
- Collecting data from local business units impacts operational effectiveness
- Lack of local business unit engagement and resources for Strategic Planning
- Limited real-time external market monitoring
- Difficulties comparing global / local information
- Analytical resource constraints
- Objectivity and independence

STORM FORECASTS: market fundamentals drive model

medicalized treatment units by species and average animal health spend (ex-manufacturer net sales) by product group for the 10-year outlook

Medicalized Treatment Units (MTU)



Spend by Product Group per MTU

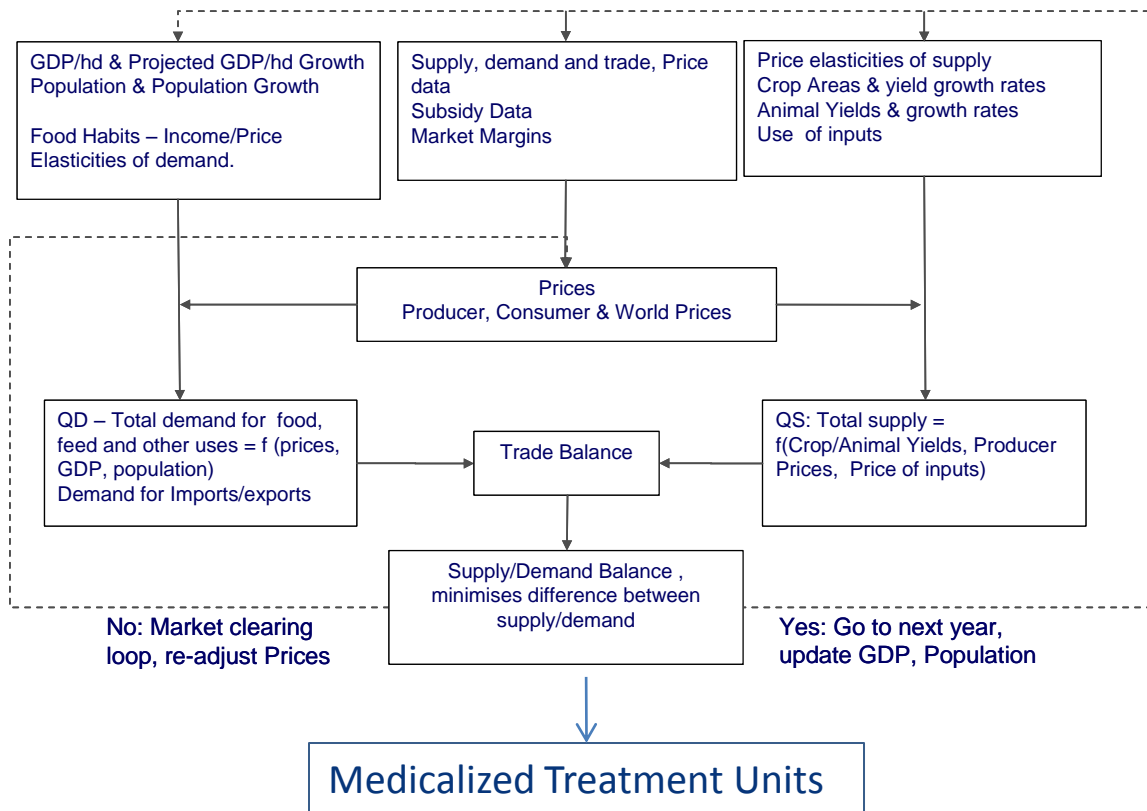
STORM partial-equilibrium model provides 10-year MTU forecasts by species by country

Animal Health Market Model: 10-year historical data of spend by Product Group per MTU by country ; judgement-based adjustment to underlying baseline trends; and judgement-based analysis of specific events

- Specific events include:
- Product approvals/withdrawals
 - Genericismation
 - Policy issues
 - Regulatory issues
 - Macro-economic environment
 - Animal agriculture environment

Medicalized Treatment Unit (MTU) Forecasting

a sophisticated global partial-equilibrium model that facilitates animal agriculture market simulation and demand forecasting



- Macro-economic impact on animal protein consumption well understood and can be modelled
- Robust market simulation model that is driven by fundamentals of demand and supply

- by species
- by country
- by year

STORM MODEL utilises algorithms that describe relationships between market fundamentals. This is not a simple Excel model.

Type	Constraint
Identifier	MarketClearing
Index domain	(i, n)
Text	Market clearing equation
Unit	kton
Property	
Definition	$QS(i, n) - QD(i, n) - QEX(i, n) + QIM(i, n) -$ $(Endstocks(i, n) - Initialstocks(i, n)) - Loss(i, n)$ $- QEUex(i, n) + QEUIm(i, n) = balance(i, n)$

Market Clearing equation ensures that production (QS) and consumption (QD) remain in balance within a country for any given animal protein product, whilst also accounting for Trade, Stock changes, Loss or Wastage.

Human consumption of food product (fo) in country (n) depends on:

- PD(fo,n) - Retail Price of Product
- Ped(fo,fo,n) - the price elasticity of demand for product fo
- PD(fi,n) - Price of Alternative Products
- Ped(fi,fo,n) - Cross price elasticity of demand
- CurrentGDPperhead (as a proxy for income),
- rho(fo,n) - Income elasticity of demand
- pop(n) - human population
- alphaf(fo,n) – a constant term calibrated to replicate the base year data

Type	Variable
Identifier	QF
Index domain	(fo, n)
Text	
Range	[QFLower(fo, n), inf)
Unit	kton
Default	
Property	
Nonvar status	
Definition	$alphaf(fo, n) * (PD(fo, n)**Ped(fo, fo, n)) *$ $(prod [fi, PD(fi, n)**Ped(fi, fo, n) $(ord(fi) <> ord(fo))])$ $* (CurrentGDPperhead(n)**rho(fo, n)) * (Pop(n)) ;$

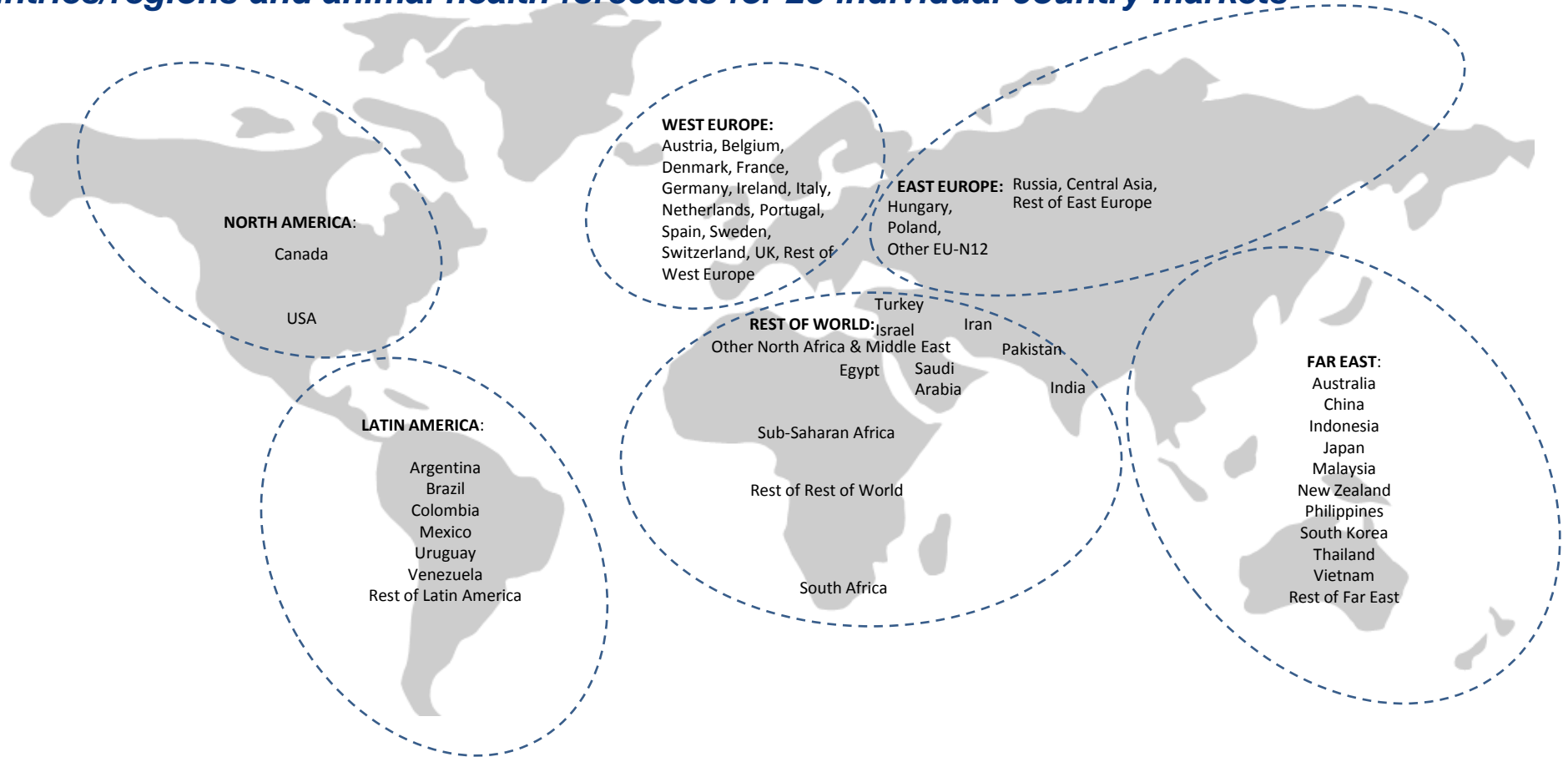
Type	Variable
Identifier	Slaughtered
Index domain	(mt, n)
Text	Non breeding animals slaughtered for meat
Range	nonnegative
Unit	Khd
Default	
Property	
Nonvar status	
Definition	$alpha(m, n) * ((SLtm1(m, n)**slag(m, n))$ $* sum [sp, Otherinventory(sp, n) * ytb(m, sp, n)] *$ $((PS(m, n)**etal(m, n)) $(etal(m, n) < 0) *$ $(prod [b, (PI(b, n)**(1*gammaf(m, b, b, n))) $(gammaf(m, b, b, n) < 0)])) ;$

Animals Slaughtered for meat (MT) in country (n) is dependent on:

- › SLtm1 (mt,n) – Number of animals slaughtered in the previous year
- › Sllag (mt,n) – An adjustment co-efficient
- › Other inventory – Non Breeding Animals Available for Slaughter
- › PS (mt,n) – Producer Price of meat – MT
- › etal(mt,n) – Price elasticity of supply of animals for slaughter
- › PI (b,n) – Feedprices
- › Gammf (mt,b,b,n) – Price elasticity of demand for feed b for production of meat MT.
- › Alpha (mt,n) – A constant term calibrated to replicate the base year results.

STORM FORECASTS coverage

global, regional and key country market coverage with animal agriculture forecasts for 57 countries/regions and animal health forecasts for 25 individual country markets



STORM FORECASTS: 2011-20 dataset

Control panel

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Country Key
Data Key
Glossary & Sources

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