

Value of Animal Traceability Systems in Managing a FMD Outbreak

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Presentation at USDA-ERS

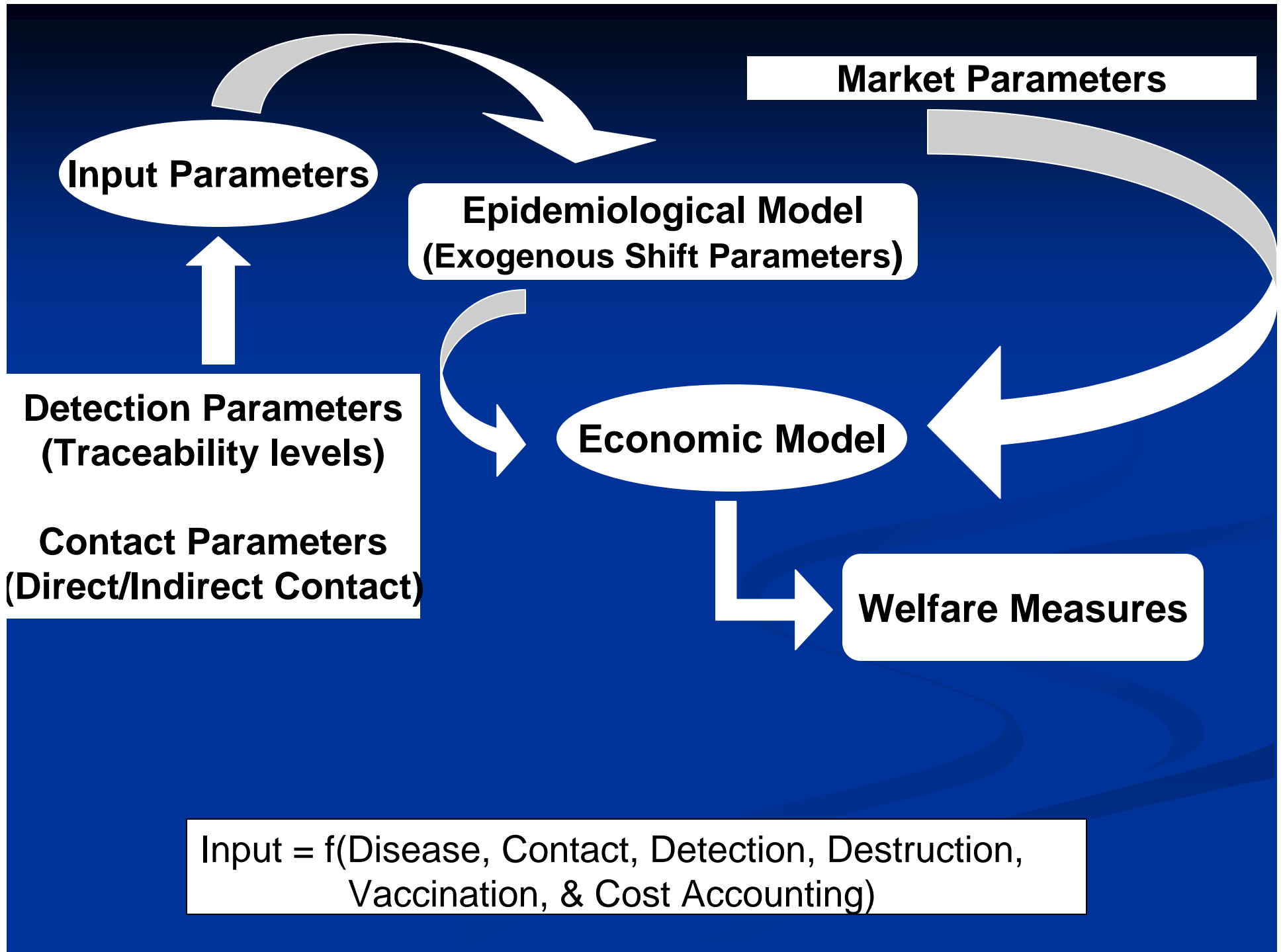
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Objective

- Evaluate impacts of different depths of animal id in the event of a FMD outbreak
 - Use epidemiological disease spread model to evaluate the impact of a FMD outbreak in SW KS
 - Integrate epidemiological disease spread model with economic model to capture welfare outcomes



Epidemiological Model

- North American Animal Disease Spread Model
- Stochastic temporal and spatial spread model that simulates FMD outbreak

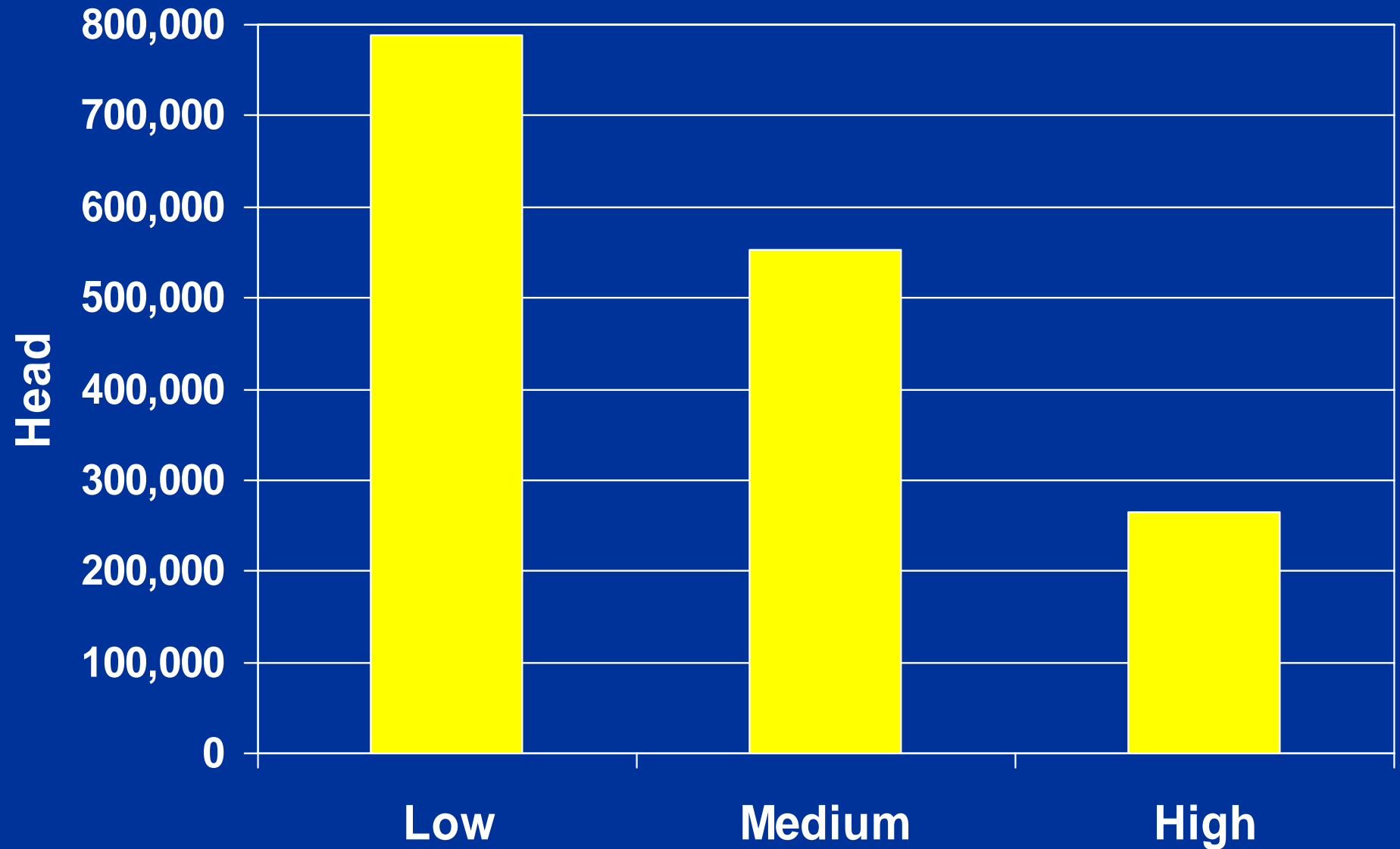
Identification Levels

- Low
 - 30% successful trace within 24 hours
 - Current U.S. animal ID system
- Medium
 - 60% successful trace within 24 hours
 - Potential voluntary U.S. animal ID system
- High
 - 90% successful trace within 24 hours
 - Potential mandatory U.S. animal ID system

Economic Model

- Equilibrium displacement model
 - Estimate welfare changes due to exogenous shock
 - Exogenous shift
 - Epidemiological model
 - Market parameters
 - Previous literature & estimation
 - Monte Carlo simulations
- System contains 44 equations
 - Consumer substitutability
 - Farm-Retail marketing chain
 - Kansas and Other States

Number of Animals Stamped-Out



Short-Run Welfare Changes with Change in Demand (\$ million)

Beef Producer Surplus	Animal Identification Intensity		
	Low	Medium	High
Retail Level	-238.72	-228.29	-214.89
Wholesale Level	-144.76	-121.79	-92.18
OS Slaughter Level	-65.46	-57.69	-48.10
KS Slaughter Level	-69.27	-43.51	-22.21
OS Farm Level	-64.51	-48.51	-27.62
KS Farm Level	-1.18	-2.06	-1.16
<i>Total Beef</i>	-583.91	-501.85	-405.00
<i>Total Meat Industry</i>	-534.95	-471.83	-399.29
Total Consumer Surplus	-270.98	-219.80	-154.11

Summary of Findings

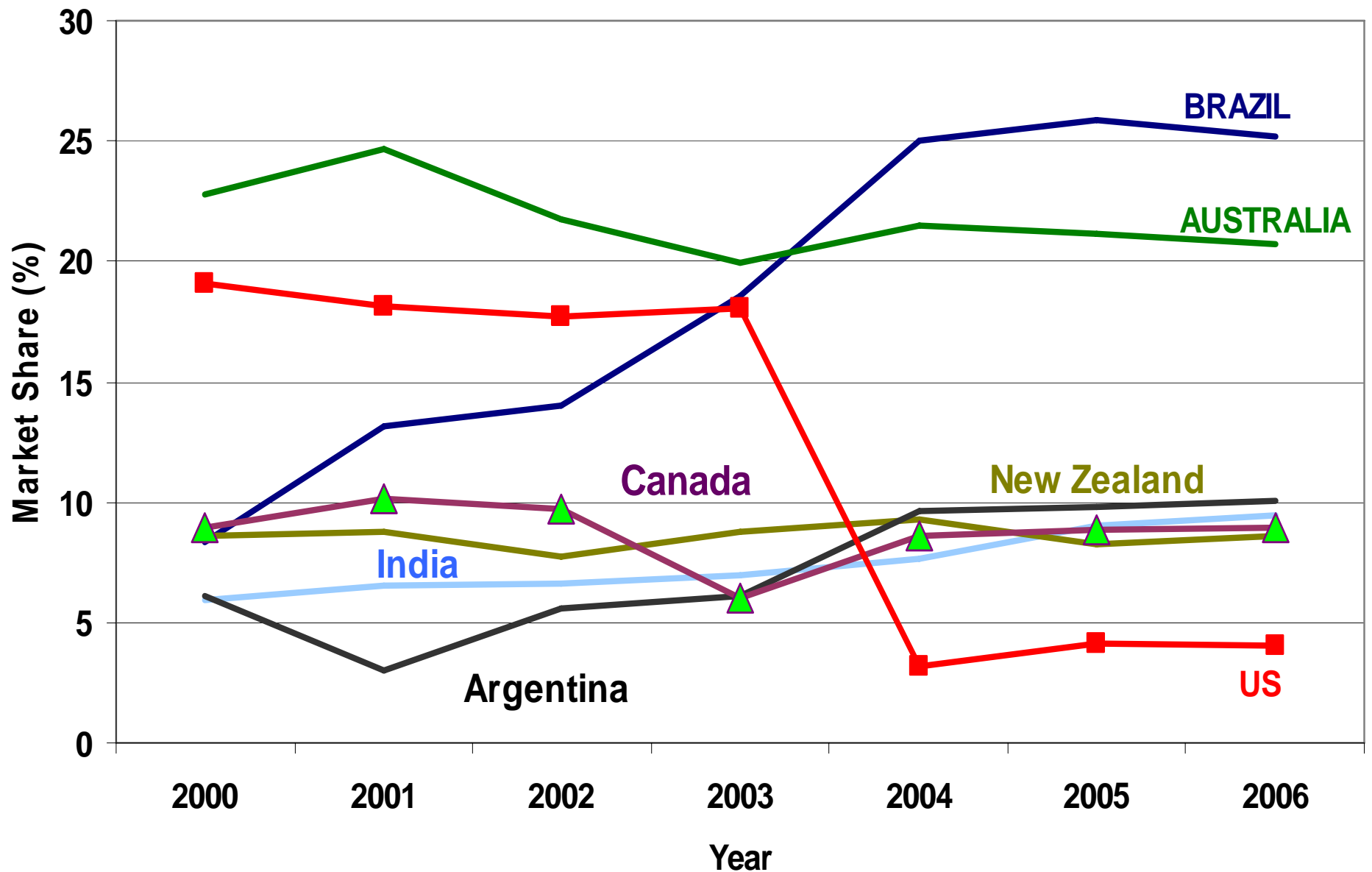
- FMD outbreak
 - Reduced quantity and increased costs leads to reduction in consumer and producer surplus
 - Consumer – \$410.04 million
 - Producer – \$626.70 million
- Increased animal ID levels
 - Difference between low and high ID levels
 - Consumer – \$220 million
 - Producer – \$205 million

Future Extensions

- Economic
 - Traceability impact
 - Regional impact

Thank You

Market Shares of World Beef Exports by Country, 2000-2006 ('06 forecasted)



Source: Foreign Ag Service, USDA

