Livestock and Slaughter Waste Issues

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March 2006

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Consumer Demand for Livestock Produce

- LDC livestock production is projected to grow four times faster than in DC's.
- LDC Meat consumption increased 5-fold and milk consumption 3-fold from early 70's to mid 90's.
- Growth in pork and poultry is more than 2-times ruminate meat.
- But 800 million still suffer chronic under-nutrition and hunger.

Sources: Christopher Delgado, IFPRI, ; Gregg BeVier, AASV; Henning Steinfeld, FAO

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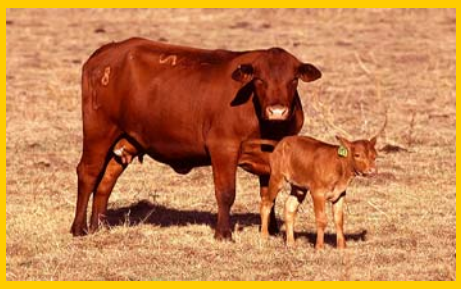

Concerns for Small-Scale Producers

- About 675 million rural poor are sustained by livestock income or ownership.
- Large-scale intensive livestock production is growing at 6 times annual growth of grazing production.
- Poor environmental and food safety regulatory enforcement in LDC's, and low energy pricing, favors the large intensive livestock producers.

Sources: IFPRI, FAO and World Bank Reports

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LDC Slaughter/ Processing

- Some DC importers require LDC modern intensive livestock production to link to modern efficient slaughtering and rendering facilities.
- Unless contracting to the large producer/processors, small holders have access only to live markets and public slaughterhouses, most of which are old and unsanitary, with minimal veterinary controls.
- Fees paid by slaughterers to support the public slaughterhouses are kept low to discourage illegal slaughtering outside of the facilities.

Source: David Gue, Guidelines for Livestock Marketing and Processing

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LDC Livestock/ Slaughter Waste Issues

- Most livestock production manures are applied to land without treatment or quality control (arsenic, antibiotics, drug-resistant pathogens, nitrogen, phosphorus, pesticides).
- Animal by-products from public slaughterhouses often sold to informal sector recyclers who make animal feed.
- Washwater and unrecycled blood is discharged to sewers, usually with no wastewater treatment.
- Unrecycled animal by-products, carcasses from diseased rejected livestock, and manure from slaughter holding pens are discharged to open dumps where domestic animals, dogs, rats,and wildlife, including wild birds, scavenge for food.

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Slaughter Waste Recycling into Animal Feed

- BSE prion proteins are not destructible by composting or normal rendering temperatures.
- Disease spread among cows by affected slaughter waste processed into animal feed.
- Incubation is 5+ years, enabling large scale infection before disease symptoms manifest.
- Related TSE's exist in sheep, domestic cats, large cats, bison, and mink; Sheep scrapie can infect humans through contact with carcasses and placenta.

Sources: John W. Willesmith, Manual on BSE, and EU data

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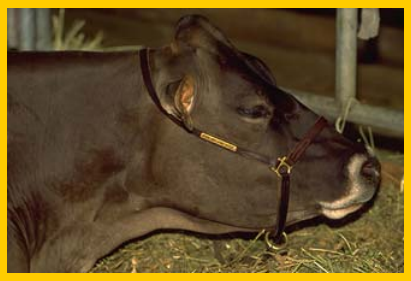

Recent Disease Outbreaks of Major Economic Consequence

- **Human disease outbreaks from zoonotic origin:**
  - transmissible spongiform encephalopathy (protein prions),
  - severely acute respiratory syndrome – SARS (coronavirus), highly pathogenic avian influenza (virus).
- **Animal disease outbreaks:**
  - foot-and-mouth disease (virus),
  - swine fever (virus),
  - newcastle disease (virus).

Sources: USDA and OIE outbreak reports

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Example Economic Impacts from Zoonotic Disease

- **SARS led to regional loss of 2% of regional GDP in East Asia in second quarter of 2003.**
- **Europe destroyed over 5 million cattle to stop spread of BSE (mad cow) and suffered major export losses.**
- **UK's 2001 outbreak of foot-and-mouth disease cost $1.7 billion to compensate farmers for culling 4.5 million hooved animals. Argentina's 2000 outbreak of foot-and-mouth disease disrupted beef exports for 3 years.**
- **Vietnam and Thailand lost 15-20% of poultry stock from avian influenza (H5N1) mortalities and culling…over 50 million birds. Globally, over 145 million birds died or culled for H5N1 avian influenza since 2003.**

Sources: World Bank, EU, CIDRAP, OIE and USDA data

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Avian Influenza H5N1 Incidents – domestic and wild birds

- **East Asia –** Cambodia, China,Hong Kong, Indonesia, Japan, Laos, Malaysia, Mongolia, Mynamar, South Korea, Thailand, Viet Nam, Cambodia
- **Europe, Middle East, North Africa –** Afghanistan, Bosnia & Herzegovina, Croatia, Romania, Turkey, Egypt, Iraq, Iran, Saudia Arabia, Cyprus, Greece, Germany, Austria, Italy, Bulgaria, Slovenia, Azerbaijan, France, Denmark, Hungary, Slovakia, Albania
- **Central, South Asia** -Pakistan, India, Kazakhstan, Russia, Ukraine, Georgia, Yemen, Sweden, Switzerland, Serbia and Montenegro, Israel
- **Africa –** Nigeria, Cameroon, Niger, Zimbabwe

Source: OIE, FAO, WHO

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Domestic Bird Outbreaks of H5N1

- **Large numbers infected.**
- **Country-to-country spread mostly through trade of live birds.**
- **Chickens, ducks, geese, turkeys, quail, pigeons, ostriche, peacocks, guinea fowl.**
- **H5N1 virus commonly spreads into blood, eggs, and flesh of infected birds.**

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Wild Birds Found Dead and Positive for H5N1

- Small numbers compared to domestic birds.
- Likely infected by excreta-contaminated water and land from domestic birds, or ingestion of contaminated flesh of discarded domestic birds.
- Ducks, geese, swans, cormorants, gulls, pigeons, crows, starlings, hawk, owl, goshawk, stork, heron, pelican, buzzard, myna, magpie, sparrows.

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H5N1 – Hardy Virus Spread in Excreta

- Infected birds shed large amounts of virus in excreta for weeks, even if infected birds are asymptomatic.
- H5N1 virus in excreta can remain infective at moderate temperatures for weeks in the environment, and over a month in cold water, and survives indefinitely in freezing conditions.
- LDC issue of open dumping and land spreading of excreta without treatment.

Source: WHO, CIDRAP

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H5N1 – Entire Infected Bird is Contagious

- **Infected domestic ducks and other birds may be asymptomatic, but be as contagious as those showing symptoms.**
- **Direct contact with carcasses and ingestion of undercooked birds can cause infection in humans and wide range of mammals.**
- **LDC issue open dumping of slaughter wastes where wild birds and animals may forage, and humans are sorting.**

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H5N1 Virus Inactivation

- **Temperatures of 56°C for 3+ hours or 60°C for 30+ minutes:**
  - anaerobic digestion~70°C+
  - composting ~40°C- 60°C
- **Acidic pH conditions:**
  - anaerobic digestion maintains acidic conditions.
  - composting becomes acidic briefly then becomes alkaline.

Source: OIE, WHO, CIDRAP

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H5N1 - Excreta, Carcasses, Blood Disposal

- Siting and trench burial to limit accessibility and minimize movement of the virus through leakage, drainage or aerosol.
- Composting involves excessive handling and dust, not recommended for highly pathogenic material.
- Anaerobic digestion would be contained and destructive to the virus.
- Incineration equipment rarely available for large quantities, very costly for wet materials, high risk of downtimes, and dependent on fuel availability.

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Global Externalities - Economic Instruments

- Poor conditions at LDC municipal markets, slaughterhouses, and disposal sites are links in the zoonotic disease chains. Municipalities need intergovernmental investment and recurrent budget support to close these links.
- Environmental improvements in livestock and slaughter waste management would address global climate change goals, and continued carbon finance is needed to sustain waste systems.
- Intergovernmental subsidies for manure treatment and transport to rural lands would improve rural soil conditions and reduce nutrient loadings in peri-urban areas of intensive livestock production.

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Collaboration Essential to Success

- Bank and IFC need to work together to bring in private sector to upgrade and operate slaughter facilities, regional waste management, and set up biosecurity certification.
- Agriculture, Health, Urban, Environment, Social, and Infrastructure collaboration needed.

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For waste management information:

http://www.worldbank.org/solidwaste

For zoonotic disease updates:

FAO, OIE, WHO, CIDRAP

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