Disease transmission by air transportation of animals
Need and Value of International Animal Transport

• Domestic animals / animal products
  • Trade: animal breeding, rearing, slaughter; semen, embryos, hatching eggs
  • Competition, Military, Humanitarian

• Wild animals
  • Trade: legal/illegal, formal/informal
  • Zoos, Species conservation, Ornamental /exotic pets

• Research (both domestic and wild)
Consequences of Introducing a New Disease

• Animal Health
• Human Health
• Trade → “Economic” Health

• Through transport of:
  • live animals
  • animal products
  • animal pathogens
Equine influenza

- Ubiquitous except NZ, Iceland and Australia

- Aug. 2007: H3N8 from Japan (4 Japanese racing stallions in incubation) detected in Post Arrival Quarantine (14dy) in Sydney

- Then escape from the quarantine station (??)

- 150,000 horses vaccinated,
- Direct cost 289 ME
- Impact on industry 297 ME

- Eradicated late December 2007

- Similar risk for glanders? African Horse sickness?
Live poultry and Avian influenza

Day-old poultry

• AIV generally lethal for embryo – close window for infection

• IA found on the surface of eggs laid by infected poultry - fumigated (formaldehyde) when put in the incubator (EU, OIE)

• Feacally contaminated material (trays, packaging)

Fighting cocks
• Shoes-disinfection mat and related poster on risk of FMD virus introduction on shoes at Chitose Airport (Hokkaido Region, Japan) at the time of FMD outbreaks in Kyusyu region in 2010.

Hokkaido is known livestock farming areas in Japan

• FMD, 2001, Australia: Passengers arriving at airports with mud on their shoes currently have their shoes cleaned and disinfected

S. F. Amass, 2005, Preventive Veterinary Medicine
Illegal transportation of live animals

• **2004** - Thai man **Bangkok-Vienna-BXL**
• In a hand luggage (sports bag) with open zipper, birds wrapped in a cotton cloth with head free and inserted in a wicker tube
• Mr. P: “present for his brother” living in Antwerp
• Here, a **Belgian falconer** who offered **750 Euro** for each bird had ordered the eagles & already owned birds of the same species.
• **25 people** in direct or indirect contact (veterinarian, lab staff, Thai passenger & brother) **treated**


CITES: UE imported 800,000 wild bird each year from 1999 until 2005

Crested mountain Hawk Eagle  (*Spizaetus nepalensis*)  
CITES-listed
DON’T SMUGGLE ME... I COULD BE SICK

STOP BIRD SMUGGLING BEFORE DISEASES TAKE FLIGHT.

Avian influenza (H5N1) is a harmful disease that has occurred in a number of countries affecting migratory birds, poultry production, and human health. Avian influenza and other avian diseases, such as exotic Newcastle disease and psittacosis, can be spread via smuggled birds. You can make a difference. Protecting the United States from foreign animal diseases is key to keeping our bird populations healthy.

Not only does smuggling decrease the population of rare birds in the wild, it also increases the chance that a communicable bird disease could enter this country.

You can help! Call 1-800-BE ALERT to report bird smuggling or bird products being brought into the United States.

If you are carrying any of the following products, declare them:
- Poultry or other live birds, including pet birds
- Poultry meat
- Eggs
- Other products derived from poultry and other birds, such as unprocessed paws, beaks, and feathers

Courtesy of Paul Meuleneire, Customs Investigations Officer, Anti-drug Group, Bruxelles
• ASFV remains infectious
- 150 days in boned meat at 3°C,
- **140 days in salted ham,**
- several years in frozen meat

• EFSA: the risk of coming in the EC ”is moderate, moste likely through food waste”
**ASF and waste**

**Brazil 1978**

- Antonia Carlos Jobim Airport, **Rio**: police officer collecting **leftovers from meal** served on international flights for his pigs (1000 anl)

- Index cases <-> flights from endemic Spain and Portugal

- Emergency costs: **US$13 million**
- 66,900 anl slaughtered
- Eradication costs **US$21 million**
- Free in **1984**

Sampling during 2 weeks in RCDG

• 29 flights, 134 passengers from W & C Africa

• 55 passengers: fish (446kg) / domestic meat (158kg) - 9 passengers: bushmeat (176kg)

• estimated tonnes/week: fish 46 – livestock 12 - bushmeat 5.25 (273/year)

A.L. Chaber, 2010, Conservation Letter
Bushmeat

Perception very much associated with **risks for** the person who **hunted** and killed the animal

No vet inspection but dressed, smoked, dried or salted; then cooked during hours

Not really more than organisms that are associated with **foodborne illness**

| **Bacteria**                          |  | **Virus**                                    |
|---------------------------------------|  |                                             |
| salmonella, campylobacter, VTEC, Shigella, TB, C.perfringens, and non-plague Yersinia species (Y. enterocolitica, Y pseudotuberculosis), brucella. curtaneous anthrax |  | monkeypox                                  |
| cross-contamination                   |  | handling - **Very Low**                    |
| **Med-Low**                            |  |                                             |
| Parasites                             |  |                                             |
| giardia, cryptococcus, T saginata, T solium, echinococcus, toxoplasma. trichinella |  |                                             |
| **Very Low**                           |  | handling - **Very Low**                    |

from R. Skinner, 2005, Food Standards Agency
Sniffer dogs are being used in the UK at Heathrow, Gatwick and Manchester airports to screen passengers and baggage from China, Russia, Egypt, Thailand and Vietnam for possible smuggled food.
ATTESTATION DE LIBRE CIRCULATION DES DENRES ALIMENTAIRES

Je soussigné, Médecin Chef du Centre d’Hygiène Générale de Brazzaville, certifie par l’examen des denrées alimentaires suivantes :

- Poissons fumés
- Poissons salés
- Mammis
- Gires

Les denrées alimentaires sont indemnes de toute contamination, par conséquent elles sont dorénavant admissibles pour la consommation.

Je soussigné, A.L. Chaber

02/06/2008

CERTIFICAT SANITAIRE

Je soussigné, Officier Sanitaire de l’Hygiène des Fraternités Division de Pointe-Noire.

Certifie que Mr. Mme en la société : 

Voyageur en direction de : Paris (France)

Transporte hors de notre pays, un lot des denrées alimentaires ci-dessous, présentant un caractère pathogène d’aliment impropre à la consommation humaine :

Nature :
- Poisson salé
- Viande de chasse
- Pâtes
- Fruits
- Poisson fumé
- Pâte d’amande
- Miel

Origine : Localité
Emballage : Sac

Fait à Pointe-Noire, le 03-05-2008

A.L. Chaber
Dog, cat or ferret into the UK

• Approved transport company

• Pet microchipped

• Vaccinated against rabies + blood test.

• EU pet passport or veterinary certificate or quarantine (-> 6 months).

• 24-48 hours before, treatment against ticks\(^1,2\) and tapeworms\(^3\) by a vet

1-collars impregnated with acaricide not accepted

2-target: *Rhipicephalus sanguineus*: Boutonneuse Fever (also known as Mediterranean Spotted Fever). *absent from the UK, widespread throughout the Mediterranean including Italy, Spain, Portugal and Greece*

3-*Echinococcus multilocularis*, present in France, Germany, and other parts of continental Europe. Traitement praziquantel
Lack of appropriate facilities for quarantine and seizures

• Quarantine for the US: 40 days (all-in; all-out)

• High stress: unnatural social situation, unfamiliar diet, handling...

• **Nodes** for disease transmission

  ➢ Aug 2011. **4250** illegally imported parrots in **Domodedovo Airport, Moscow**. Placed in the temporary storage house. Inspection revealed 200 dead birds, which tested positive for **psittacosis** (ornithosis). All live parrots and carcasses **send back** to **Uzbekistan**,

  ➢ Same happened in 2008 in Orenburg Oblast, 1,500 parrots and canaries from Kazakhstan, **13 human cases**

  ➢ Same happened in 2009 **Kurgan Oblast**, large illegal import of pet birds from Kazakhstan 21 human cases. In that case, birds seized were **illegally distributed** to the local citizens instead of being destroyed

  ➢ Other stories...? few crocodiles at Borispol International Airport in the middle of Ukrainian winter...put in a cold storage area and all died.

  ➢ .../...
Vectors do not need papers

• *Leishmania infantum*: visceral and cutaneous leish.
• Prev. in dogs up to 30% in the Mediterranean
• Collars treated with deltamethrine
• *Dirofilaria immitis*, babesiosis, *Ehrlichia canis*,

Monthly totals of cats and dogs entering England

E. Fevre, *Trend in Microb.*, 2006 – data from DEFRA

Observed and predicted distribution of *Phl. perniciosus*

P. Ready & DJ Rogers, EDEN project, not published

Courtesy: P. Ready, NML
The Sanitary and Phytosanitary Agreement and WTO Standard-setting organisations: the 3 sisters

- Animal health and zoonoses (OIE)
- Food safety (CODEX)
- Plant health (IPPC)
OIE International Standards

Terrestrial Animal Health Code – mammals, birds and bees

Aquatic Animal Health Code – amphibians, crustaceans, fish and molluscs

Manual of Diagnostic Tests and Vaccines for Terrestrial Animals

Manual of Diagnostic Tests for Aquatic Animals
### Relevant Sections of the OIE Terrestrial Code

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### Section 7. Animal welfare

| Chapter 7.4 | Transport of animals by air                                      |

Measures Applicable
Before and at Departure

Animals for breeding, rearing or slaughter

- Animals correctly identified and meet the requirements of the importing country
- Required biological tests and/or vaccinations administered
- Observation of the animals before leaving the country

Notification

- Countries exporting should inform the country of destination/transit if, after exportation, a listed disease occurs in/related to the establishment of origin of the exported animals

Certificate

- International veterinary certificate conforming with the models approved by the OIE
Measures Applicable During Transit

Transit country

- may refuse if consider that certain diseases exist in the exporting/preceding transit countries capable of being transmitted to its own animals or animals show signs of such diseases (when examined by Official an Official Veterinarian), or if the international veterinary certificate is inaccurate and/or unsigned
- If the diagnosis is confirmed, the animals shall either be returned to the exporting country or be slaughtered or destroyed

Unexpected landing

- immediately notification of the nearest Veterinary Authority
- animals and persons on board shall only be permitted to leave the landing place in emergency (health and safety of the humans/animals)
Border Posts and Quarantine Stations (in the importing country)

- When justified, border posts/quarantine stations should be provided with a Veterinary Service able to:
  - make clinical examinations and obtain specimens of material for diagnostic purposes
  - detect and isolate animals suspected of or affected by an epizootic disease
  - carry out disinfection and possibly disinfestation of transporting vehicles
- Each international airport should ideally be provided with equipment for the sterilisation or incineration of swill or any other material dangerous to animal health
- The presence of disease or infection in imported animals in a quarantine station does not affect the animal health status of the country or zone
Measures Applicable on Arrival

• An importing country
  • should only accept animals subjected to a health examination by an Official Veterinarian of the exporting country and accompanied by an international veterinary certificate
  • may prohibit the entry of animals if it considers that certain diseases exist in the exporting/preceding transit countries capable of being transmitted to its own animals
  • may prescribe quarantine in order to carry out clinical observation and biological examinations with a view to establishing a diagnosis.

• If the diagnosis of an epizootic disease is confirmed, or if the certificate cannot be corrected, the importing country may return the animals to the exporting country or if return not safe/feasible, may slaughter and destroy
Example – Transport of Animals for Research

- IATA Regulations
- Many species
  - mostly rodents (rats, mice)
  - Dogs and non-human primates special issues
- Airlines do not need to carry research animals, and many choose not to
  - Small trade
  - Requires special environmental controls
  - Complex transport regulations
  - Provision of inspection/quarantine facilities at airports
- Result – increasingly difficult/expensive to obtain animals for research

NHP Infectious Disease Risks
- Tuberculosis
- Viral Hemorrhagic Fever
- Ebola, Marburg
- Herpes B virus
- Hepatitis
- Monkeypox
- Simian Immunodeficiency Virus (SIV)
- Yellow Fever reservoir

NHP Importation to the US - 1994 – 2007
from Marano and coll, CDC
Directions for the future

• Collaboration and coordination in standard setting organisations

• OIE agreement with IATA
  • Communicate on issues of common interest

• Collaboration as outlined in the 2010 FAO/OIE/WHO Tripartite Note
  • Harmonization of guidance
  • E.g., OIE and WHO exploration of governance processes
Thank you

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