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# Camel Diseases Control in the MENA region

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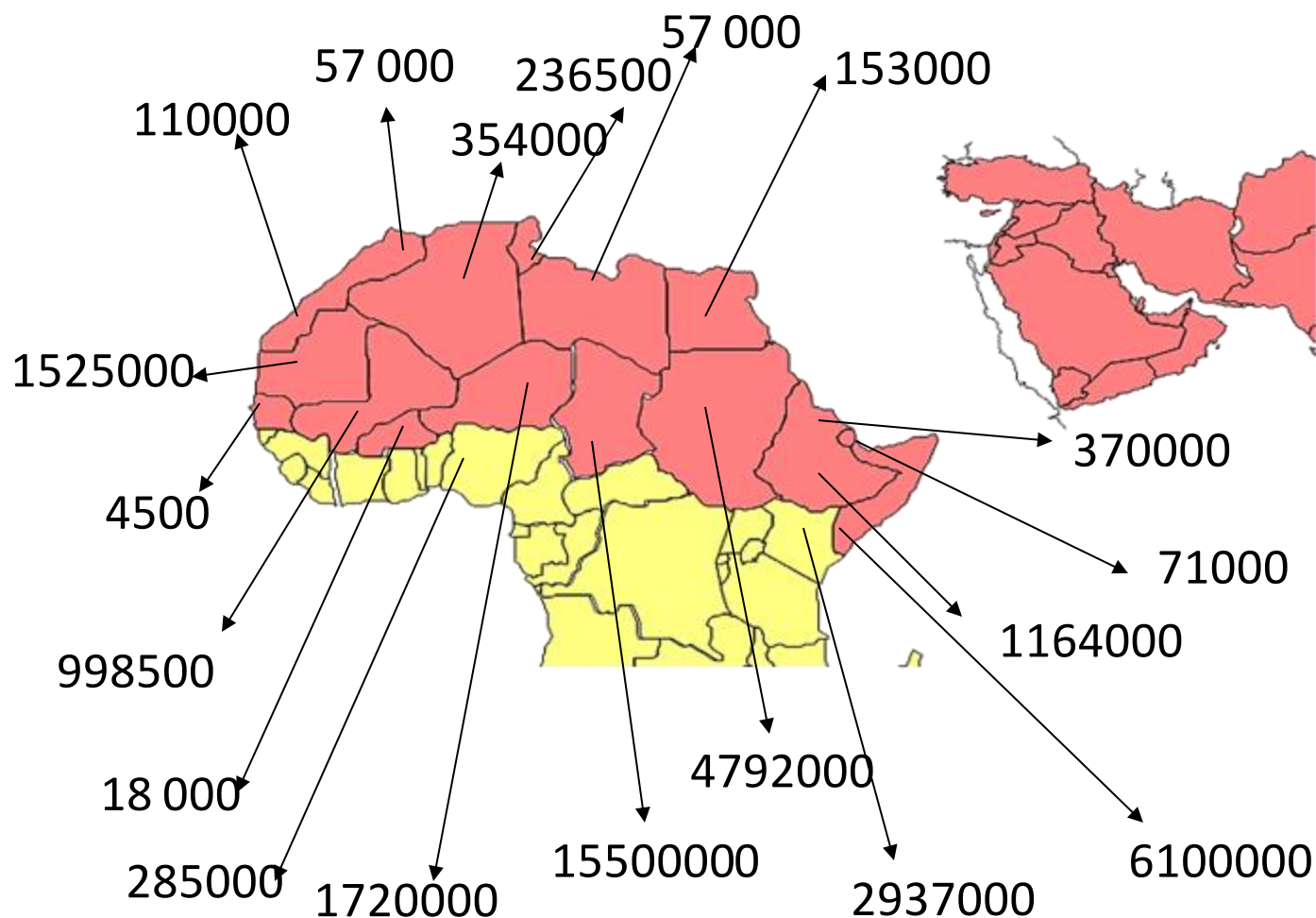


# Outlines

1. The camel in the world
2. Socio-economic importance
3. Camel disease pattern particularities
4. Emergent diseases
5. Impact of present trends of camel farming on to the health status
6. Camel diseases control systems
7. Conclusion

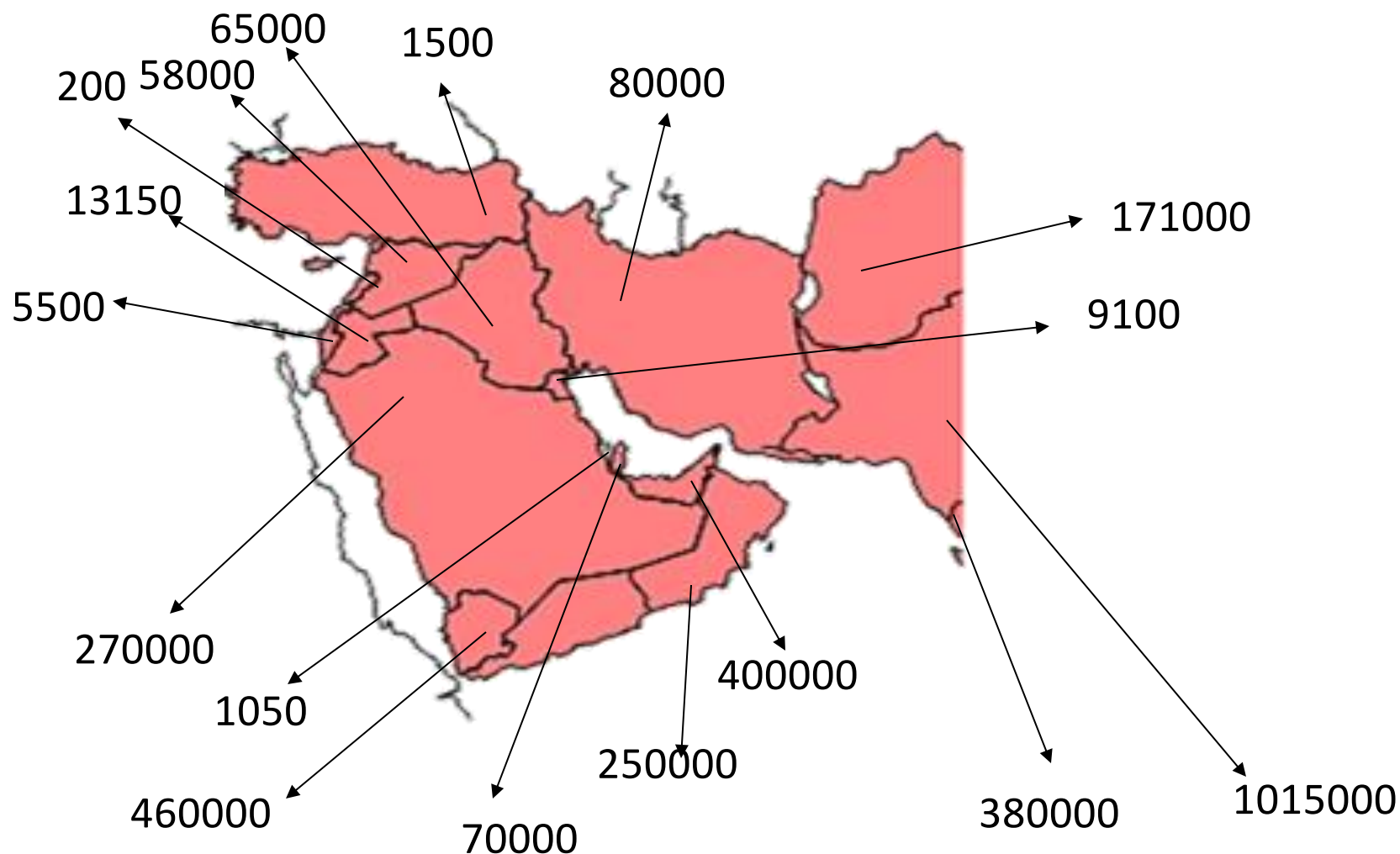


## The Camel in the world





## The Camel in the world







## In Central Asia:

### *Dromedary*

Azerbaijan	258
Turkmenistan	120000

### *Bactrian Camel*

China	376000
Kazakhstan	160000
Kyrgyzstan	264
Mongolia	350000
Russia	6625
Tajikistan	45
Uzbekistan	18400
Ukraine	800



# The Camel in the world



# The Camel in the world

## 1. Countries where camel livestock is marginal (<1% of the DHB)

- margin countries (Nigeria, Senegal, Burkina-Faso, Turkey)
- countries with mainly small ruminants (Syria, Lebanon, Iran)
- countries partially desert (India)

## 2. Countries where the contribution of camel livestock is locally important (1-8% of the DHB)

- countries with industrialization (Maghreb, Machrek)
- countries partially desert (Ethiopia, Mali, Kenya, Iraq, Pakistan)
- countries with highlands (Afghanistan, Oman)



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## The camel in the world

### 3. Countries where camel livestock is important (8-20% of DHB)

- Tunisia (exception in North Africa)
- Sahelian countries (Niger, Chad, Sudan)
- Saudi Arabia

### 4. Countries where camel livestock is the main agricultural wealth (>20% of DHB)

- Desert countries (Mauritania, Southern Morocco, Djibouti, Qatar, Arab Emirates)
- Country of pastoralist only (Somalia)



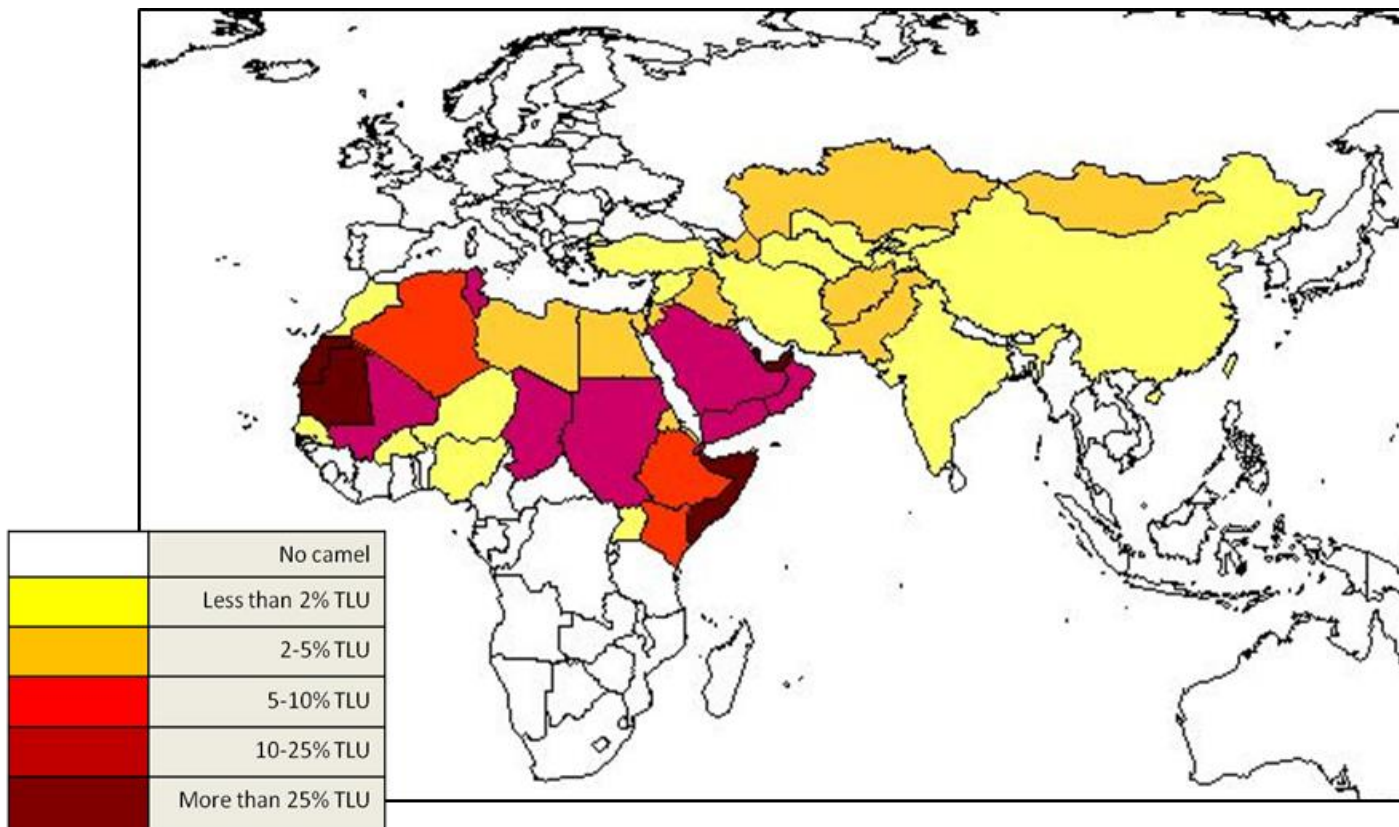




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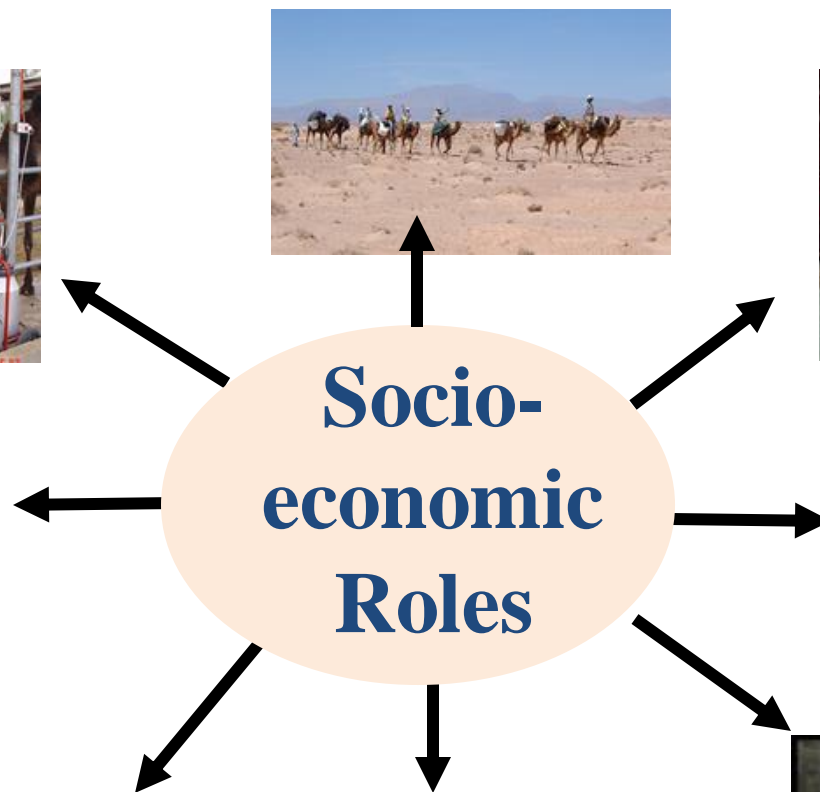
## Relative importance of camel in % of total TLU







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## Camel Health Management specificities

Frequent Herd  
Mobility

High Variation in  
Body score and  
status

Discrete  
Symptoms

Physiological  
Variation of body  
temperature

Anatomical

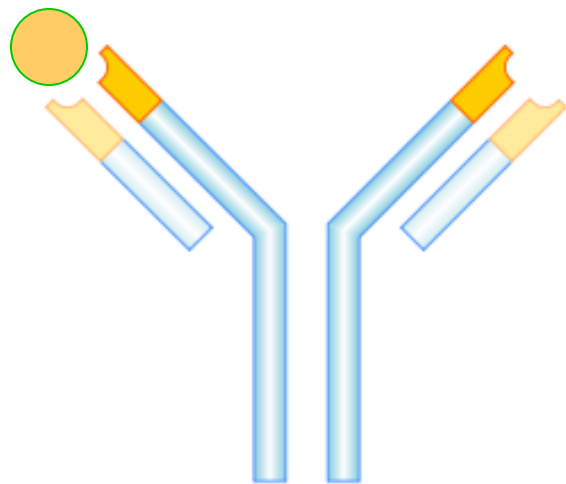
Pharmacological  
Specificities

Immunologic  
differences

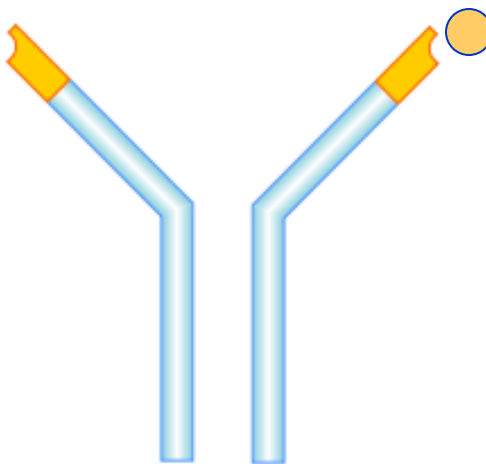


## Particularity of immunoglobulins

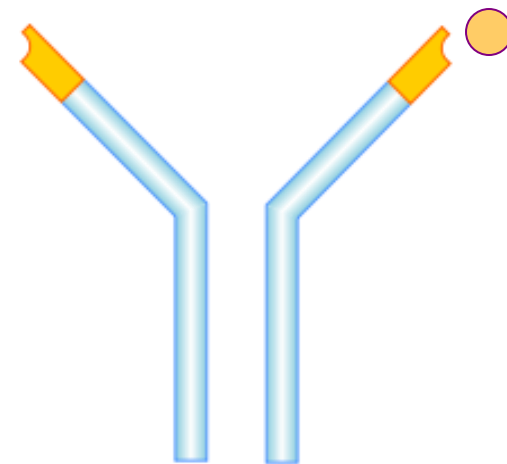
- 3 subclass of IgG: IgG1, IgG2, IgG3



**IgG1**

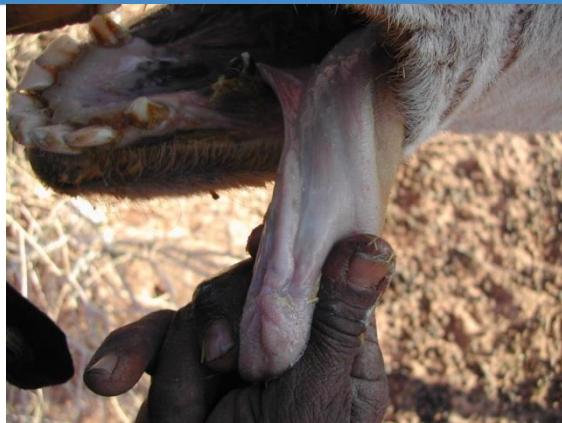


**IgG2**



**IgG3**





## Traditional knowledge

« **Amanos** », fibrous tongue  
Provoking pain feeding, t  
starvation and death

“**Taras**”, posterior and  
unilateral paresis with  
low muscular loss of  
the limb

« **Izni** » : camel with cachexia –  
gastro-intestinal parasites or  
trypanosoma??







## The specificity of health constraints in camel



- Scarcity of cattle in some areas leads to various outbreaks (RP, CBPP, FMD, BT)

- Widely spread diseases (Surra, mange, ticks, ectoparasites, internal parasites)

MERS-CoV is not a camel disease

- Multifactorial diseases (diarrhea, respiratory diseases, metabolic disorders, reproductive failures...)



## Emerging diseases

### In Africa:

- New disease in the Horn of Africa (PPR like virus)
- Unexplained overmortalities in Mali, Niger, Chad, Sudan, Ethiopia, and Somalia



Role of climatic changes?



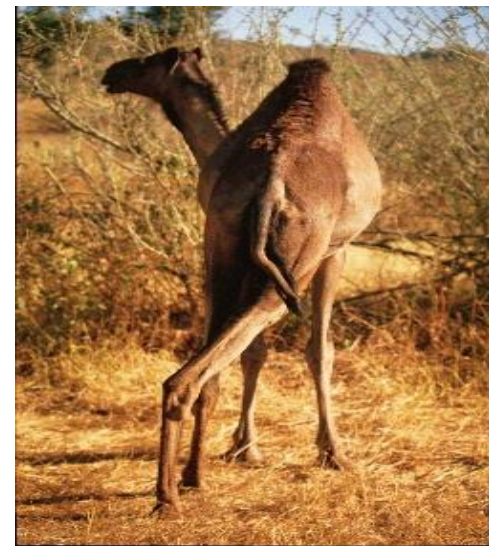
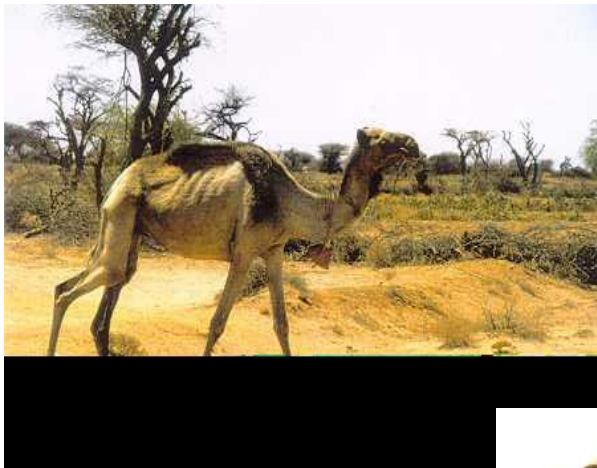


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# Emerging disease on camel

In the Horn of AFRICA



PPR like virus +  
*Streptococcus*  
*equi*,



*All samples collected in  
infected mixed herds in North  
Africa were negative for PPR*



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# Emerging diseases in camel

Over-mortality in  
Saudi Arabia -2008

Plant intoxication ?  
Mineral deficiencies ?  
Blood parasitic diseases ?  
Main virus (RVF, blue  
tongue, horse sickness) ?





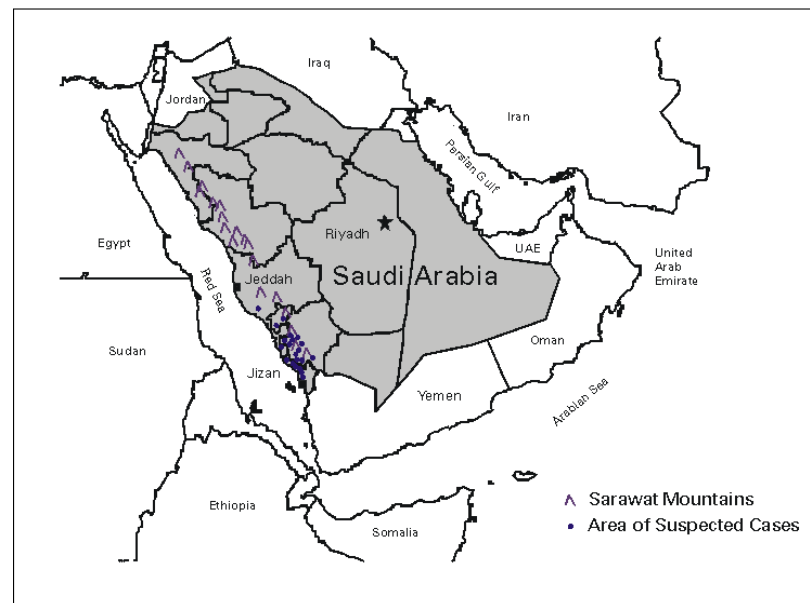


# Emerging diseases in camel

## Rift Valley Fever

Outbreak in 2000 in Saudi Arabia and Yemen killing hundred people.  
Imported by contaminated sheep and camel from the Horn of Africa

FIGURE 1. Area of reported suspected cases of Rift Valley fever — Saudi Arabia, August–October 2000



Transboundary disease



## Impact of present trends of camel farming on to the health status

- ☀ **Sedentarization and intensification** (better access to services but changes in health patterns (mastitis, mange, ticks...))
- ☀ **Stronger needs for securization of pastoral systems** (water supply management, natural pasture improvement, veterinary facilities, education)
- ☀ **Development of a camel products market** (milk and meat) around the main towns (complementarity between PU systems and pastoral systems with increasing flows)
- ☀ **Territorial expansion** (camel farming system in more humid ecosystems)

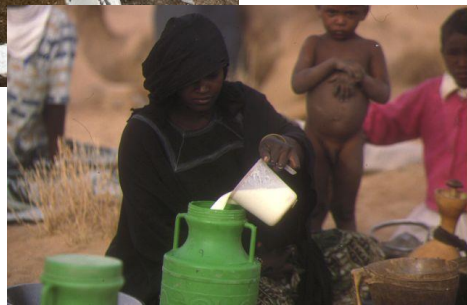
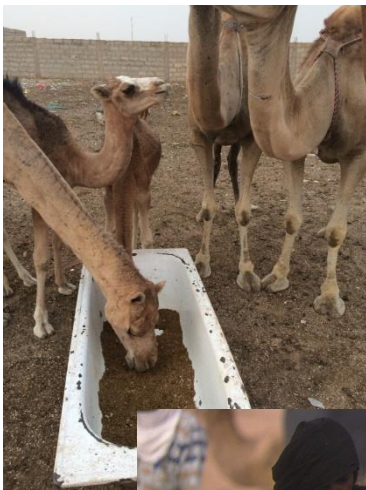


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# Development of PU dairy camel farms

**Example in Sub Saharan and  
North African countries**







## Changes in the production systems

### Dairy camel production systems in KSA

Bedouin System  
(extensive,  
mobile)  
**36%**

rangelands



Semi Intensive  
System  
**24%**

Sedentarization  
Feed complement



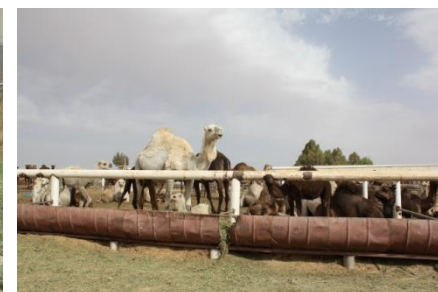
Periurban  
Systems  
**35%**

Around cities



**Intensive  
Systems  
5%**

Irrigated forage  
Industrial feeding







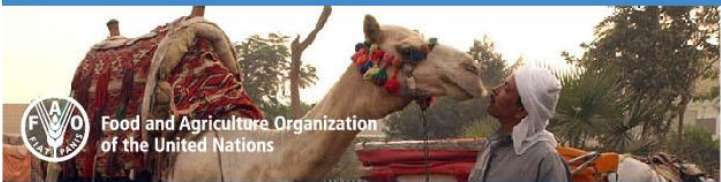
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# Camel disease control systems

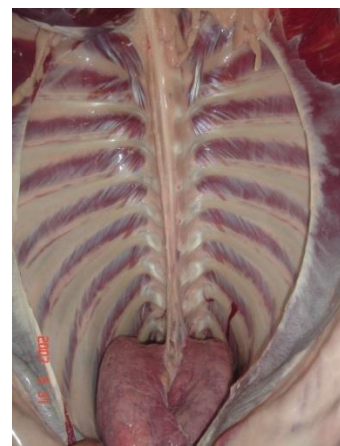
**❓ Establishment of a technical team for collecting data (slaughterhouses, markets, disease declaration or disease reporting in veterinary clinics), data analysis and edition of an epidemiological bulletin**





# Camel disease control systems

- Improvement of slaughtering conditions
- Training of technicians for meat and carcass control
- Carcass classification

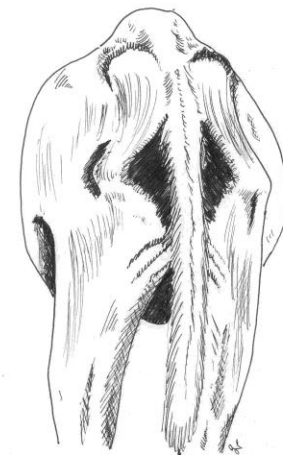
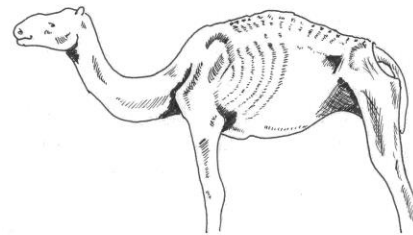
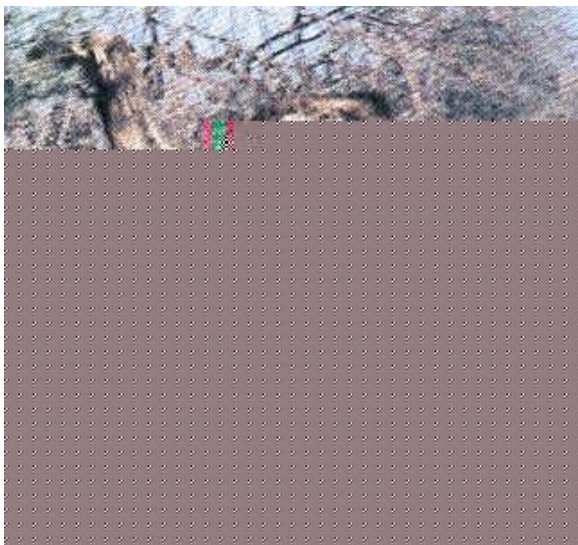






# Camel disease control systems

**[?] Capacity building for livestock technical staff in local veterinary services on camel diseases (diagnostics and treatment),**



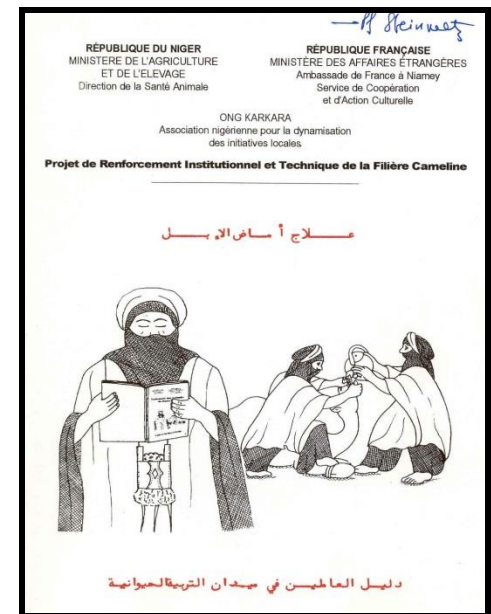
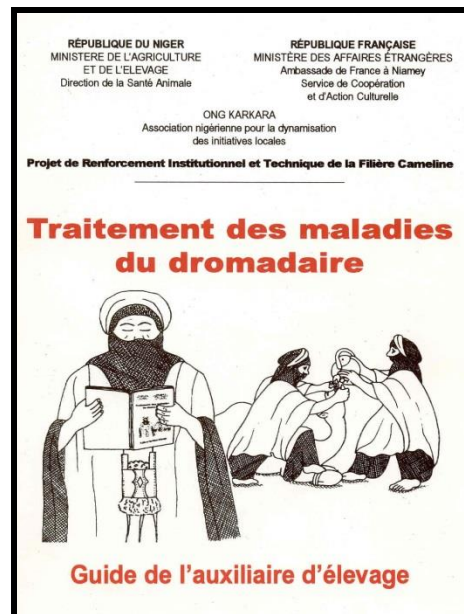


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# Camel disease control systems

❓ Extension/education and support to animal health operators including camel farmers susceptible to perform some basic treatments and drugs,





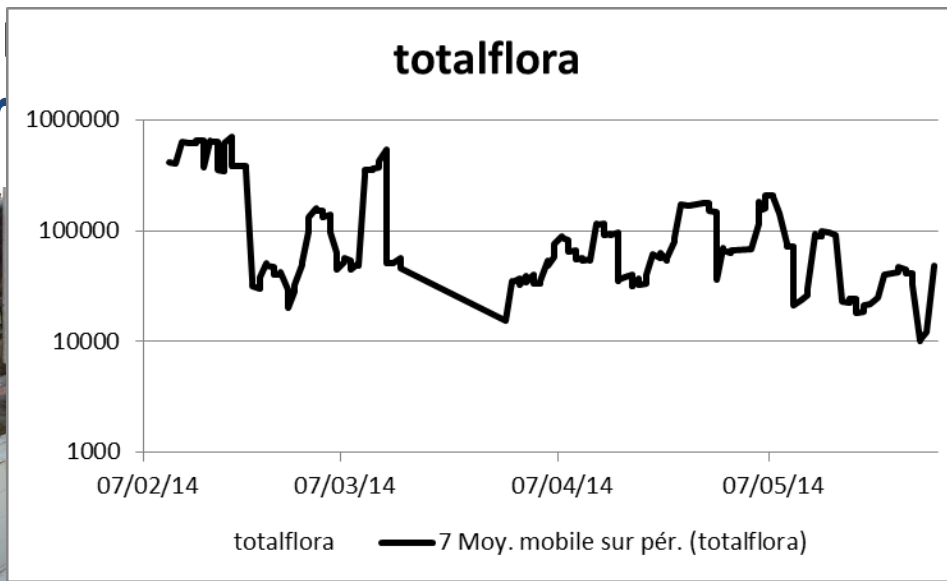
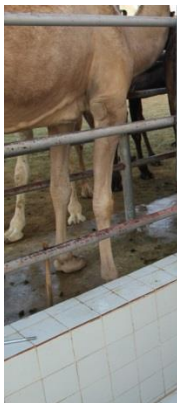


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# Camel disease control systems

Regular meetings with camel farmers  
for information  
good farm



**February 2013**

Coliforms:  $10^6$  UFC/ml

Total Flora:  $3.5 \times 10^5$  UFC/ml

**November 2013**

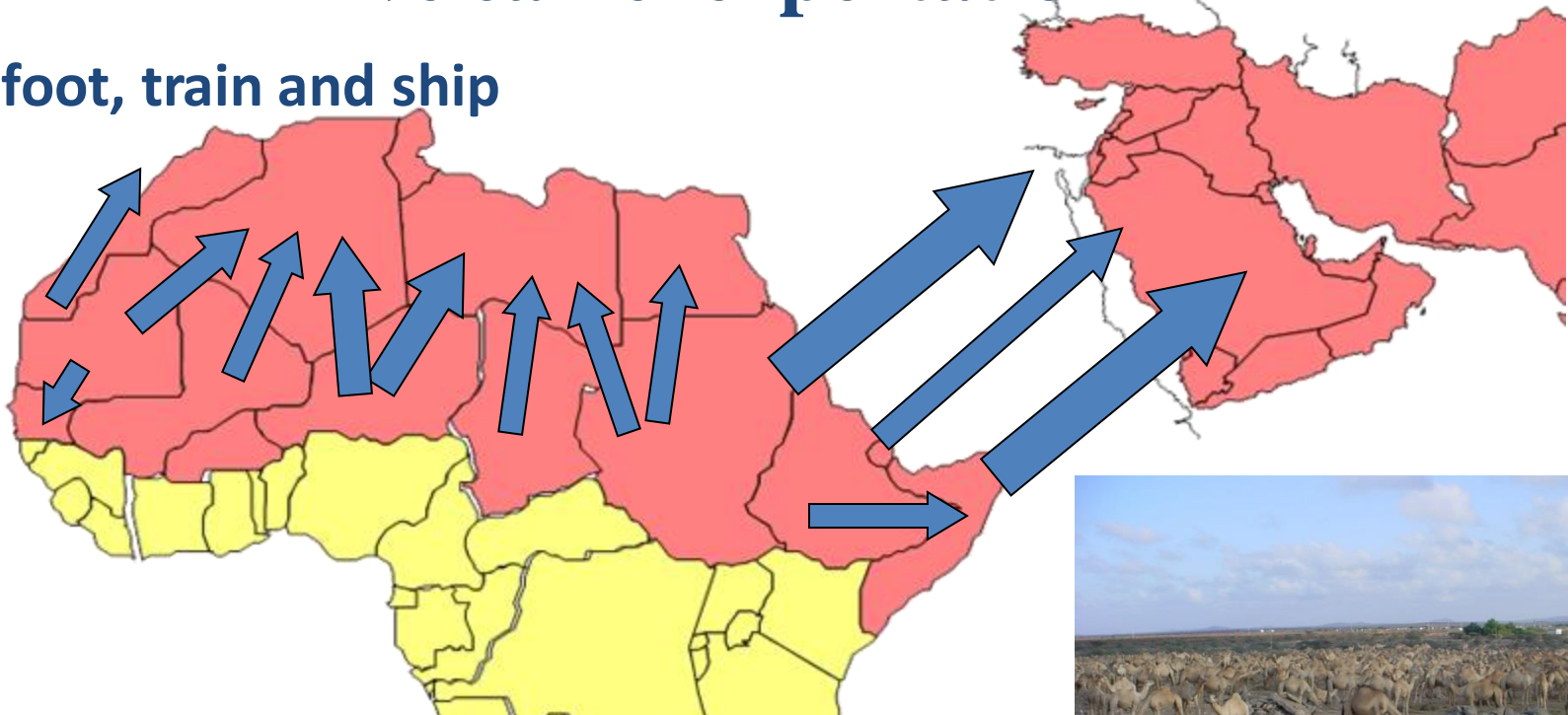
Coliforms:  $10^3$  UFC/ml

Total Flora:  $1.8 \times 10^4$  UFC/ml



# Live camel exportation

By foot, train and ship



- The flow is not well-known
- Risk for transboundary diseases



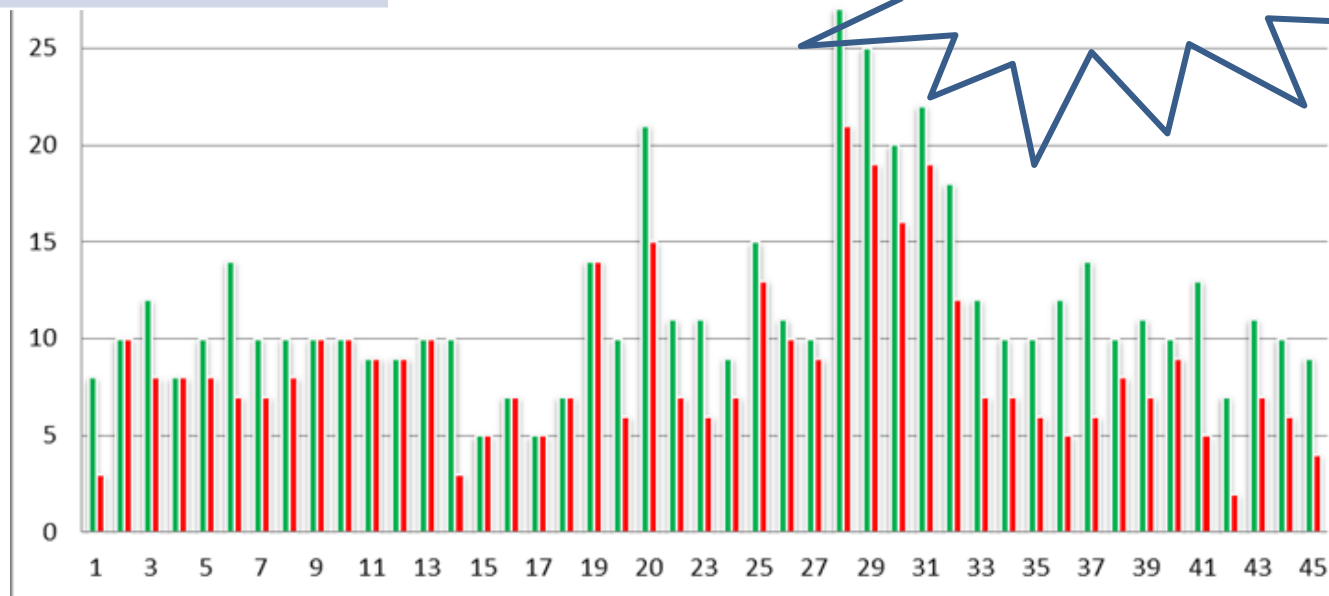
Camels for export at Djibouti



## Example in Saudi Arabia: impact of MERS on camel meat market

Year	Camel import
2013	131932
2012	136196
2011	96675

nb of  
slaughter/wk (in  
green before  
MERS outbreak;  
in red: after)







# Camel disease control system

## Djibouti example

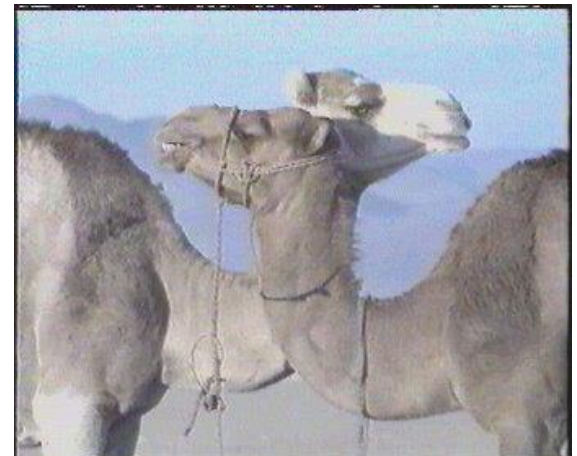
- Veterinary control is performed by the veterinary services
- A certificate is attributed for international market.
- Some serological surveys can be achieved on a sampled flock to detect main infectious diseases (Rinderpest and Rift Valley Fever).
- Certification will be guaranteed by an international organisation in charge of the certification agreement at international level (as SBS from Switzerland).



# Conclusion

The camel health control is not easy because the type of dominant farming system is :

- ✓ extensive
- ✓ nomadic
- ✓ performed in remote areas with no veterinary facilities





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**Identification of the  
main pathologies**

**Identification of the  
Risk factors**

**Economic Impact**

**Effect of farming &  
management practices**

**Epidemiological Impact**

**Effect of the environment**

**Improvement of  
management and  
farming practices**

**Improving Animal  
health**

**Pharmaceutic  
Companies**

**Adapted veterinary  
products**

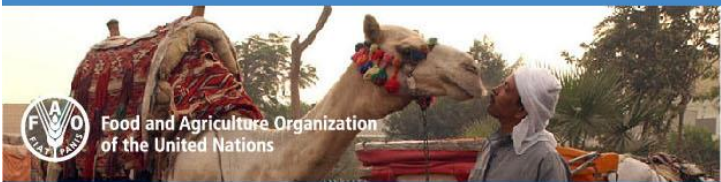
**Extension**

**Education**





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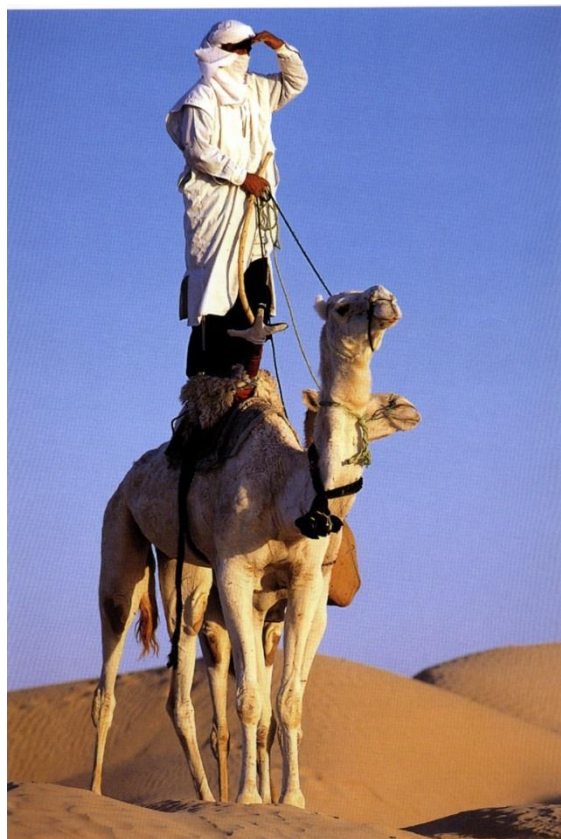


## Website on camels

- ❑ <http://camelides.cirad.fr>
- ❑ <http://www.isocard.org>



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**Thank you for your  
attention**