Main cattle systems in Morocco and research issues

Pr. SRAÏRI Mohamed Taher
Hassan II Agronomy and Veterinary Medicine Institute, Rabat, MOROCCO.
mt.srairi@iav.ac.ma
Outline

Introduction

Recent evolutions in livestock systems in Morocco

- Poultry production
- Emergence of dairy cattle systems
- Extensive ruminants’ systems

Main research issues for cattle systems in Morocco

- Animal feeding and local resources’ feed value
- Water footprint of dairy systems
- Assessment of milk quality in a context of a fragmented offer

Conclusion
Introduction

Morocco: mainly a semi-arid and arid (15 and 78% of its area) country
Location: the Western fringes of North Africa (750,000 km²)
A wide diversity of agro ecosystems: oases, mountains, deserts, plateaux, plains, etc.
An important animal wealth - several endemic breeds -

Livestock production: major roles

Demographic changes of the 20th century: implementation of policies to secure the supply of animal products
Introduction

Bioclimatic areas

1. Sub-humid area
2. Atlantic semi-arid area
3. Atlantic arid area
4. Mountain semi-arid area
5. Mediterranean arid area
6. Bush arid area
7. Mountain arid area
8. Northern atlantic arid area
9. Saharan arid area

Training Course – Livestock and Climate Change, Dakar, Senegal – January 2015
Introduction

Demography: from 1956 to 2014, population more than doubled (15.3 to 34.3 million)
Almost 60% of the people live in big cities (28% in 1956)

Changes in nutritional habits:
- more people eat outside home;
- emergence of metabolic diseases (obesity, diabetes, hypertension …).
- Shift in the demand: from red meat to poultry
- Increase in dairy products’ consumption
- More fish in the diet
- Mutton: a festal status - ceremony of “El Aïd” -

Which changes in animal production systems?
Role of research in the ongoing dynamics in animal production systems.

Training Course – Livestock and Climate Change, Dakar, Senegal – January 2015
Recent evolutions in animal production systems

<table>
<thead>
<tr>
<th>Year</th>
<th>CATTLE</th>
<th>SHEEP</th>
<th>GOATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>3.4</td>
<td>16.5</td>
<td>6.1</td>
</tr>
<tr>
<td>1985</td>
<td>2.5</td>
<td>12.8</td>
<td>4.2</td>
</tr>
<tr>
<td>1990</td>
<td>3.2</td>
<td>15.6</td>
<td>5.0</td>
</tr>
<tr>
<td>1995</td>
<td>2.5</td>
<td>16.3</td>
<td>4.5</td>
</tr>
<tr>
<td>2000</td>
<td>2.6</td>
<td>17.2</td>
<td>4.8</td>
</tr>
<tr>
<td>2005</td>
<td>2.7</td>
<td>17.6</td>
<td>5.3</td>
</tr>
<tr>
<td>2010</td>
<td>2.9</td>
<td>17.5</td>
<td>5.2</td>
</tr>
</tbody>
</table>

Number of animals linked to climate hazards

Cattle: most important species (milk and meat)

Marked changes in cattle structure:
- decrease in local breeds;
- more cattle with exotic genes.

Sensitivity to climate change?
Recent evolutions in animal production systems

Limited animal products’ consumption in Morocco

25 kg of meat (13 kg of poultry, 5 of beef and 5 of goat and mutton, 2 of camels and offals), 9 kg of fish, 57 kg of milk and 130 eggs *per capita/year*

Wide variations in animal products’ consumption among individuals, linked to the level of households’ income

Evolution of meat consumption in Morocco (1960 – 2010)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>All kinds of meat</td>
<td>13.8</td>
<td>13.1</td>
<td>12.4</td>
<td>18.3</td>
<td>19.3</td>
<td>25.0</td>
</tr>
<tr>
<td>kg/capita.year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meat from small ruminants</td>
<td>40</td>
<td>35</td>
<td>30</td>
<td>27</td>
<td>25</td>
<td>18</td>
</tr>
<tr>
<td>% of total meat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: FAO STAT 2013
The sudden emergence of modern poultry production

Implemented by private operators since early 1960s

Located in areas near the Atlantic coast (port of Casablanca)

A sustained trend of growth: 201 to 4,300 million eggs from 1980 to 2012
70,000 to 510,000 tons of broiler meat

However:
- a marked dependency on imported inputs (chicks and feedstuffs)
- an obvious vulnerability to heat stresses
- a structural weakness due to sanitary risks (avian influenza)

A strategic sector: cheap meat and eggs, but with major constraints
Recent evolutions in animal production systems

The implementation of intensive cattle systems

A shift from pastoral to almost exclusive ‘zero-grazing’ systems
- substitution of local breeds by imported cattle
- emergence of cultivated fodder in a country with marked water scarcity

The weight of agrarian structures:
- numerous smallholder farms,
- land scarcity,
- difficulties to implement support programs for disseminated farmers.

Fodder production and its challenges:
- nutritive value and how to complement?
- water uses?
The implementation of modern dairying with smallholder farms


Encouraging local milk production by a series of political choices:

- constitution of a nucleus of specialized dairy cows (Holstein and Montbéliarde)
- fodder in irrigated schemes (14% of arable land, 70% of milk output)
- incentives on strategic inputs (feed, milking machines, imported heifers, etc.)
- implementation of a milk collection policy based on farmers’ co-operatives
- protection of the domestic dairy chain by heavy taxes on imported milk powder

Challenges ahead: value chain analysis, milk quality payment, training and innovation, etc.
Recent evolutions in animal production systems

The implementation of modern dairying with smallholder farms

Cattle milk output evolutions in Morocco

Training Course – Livestock and Climate Change, Dakar, Senegal – January 2015
Recent evolutions in animal production systems

Traditional extensive livestock systems

A very old tradition of ruminants’ rearing in Morocco

Cattle mainly raised for calf crop: no selection for milk

Performances highly dependant on rainfall levels

Sheep and goats in various agro ecosystems

An animal wealth adapted to grazing in marginal areas

Meat, wool, handicraft: identity products ...
Recent evolutions in animal production systems

Traditional extensive livestock systems

Sheep production systems linked to feed resources and breeds

- pastoral systems (grazing on spontaneous herbs)
- agro pastoral systems (on-farm resources)
- oasis systems (prolific breed – D’man)

Recent evolutions

More off farm feed resources used (avoiding drought effects)

Environmental effects? Overgrazing, erosion, etc.

BUT, contribute to wealth creation

Provide high quality products (live animals with religious roles)
Main research topics

Animal feeding and feed nutritive value

Cereals: a crucial role in animal feeding

Slow emergence of cultivated fodder

Source: Ministry of Agriculture, 2012
Main research topics

Animal feeding and feed nutritive value

A series of research on local feedstuff nutritive value:

- cultivated forage crops (oat, alfalfa, berseem, etc.);
- crop residues (cereals’ straw, stubble, beet pulp, etc.)

Feeding trials with various diets … but almost no research with grazing animals
A critical topic: **pressure on water resources in an arid to semi-arid country**

Almost 70% of the total output of milk originates from large scale irrigated schemes

Studying a series of production functions in dual (milk and meat) purpose herds

1.8 cubic meters needed to get 1 kg of milk and 16.5 cubic meters to produce 1 kg of beef

A crucial issue for sustainable dairy systems
Main research topics

Resilience of intensive dairy systems

Climate uncertainty: rising tensions on the sustainability of the adopted options
Example: the widespread “miraculous” triptych - Holstein, maize silage, irrigation -
Field realities: numerous accidents because of the fragility of such choices

How to ensure sustainability and profitability?
What about other choices: local breeds? Other forages? Adding value to rainfall?
Main research topics

Assessment of milk quality in a context of fragmented offer

Milk quality payment in a supply chain with numerous smallholder farms

A critical topic: no possibility to assess milk quality parameters daily
Smallholder farms: key actors in the supply of raw milk

Numerous batches delivered daily, with variable quality parameters (fat, protein, hygiene, etc.)
A sensitive issue, particularly with limited profitability of cattle rearing.
Conclusion

Livestock systems in Morocco: significant recent changes

Most obvious evolutions: sudden emergence of poultry and dairying

Extensive systems have almost become marginal

Many challenges ahead

- Water resources (quality, depletion, ...) and adaptation to drought
- Environment (nitrogen, GHG emissions, phosphorus, pesticides, etc.)
- Feedstuffs (concentrates) and imported genes dependency
- Profitability and work load associated to animal production

Upgrading livestock systems

- Promotion of crop/livestock integration: more sustainable farming systems
- Innovations throughout animal chains: from farms to consumers
- How to increase farms’ resilience in front of climate uncertainty?
It ain't so much the things we don't know that get us in trouble. It's the things we know that ain't so.

Artemus Ward