Overview of the cattle sector in South East Europe, the Caucasian Region, Central Asia and Middle East

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2nd Workshop of the Cattle Network
EAAP 2006
Structure of the presentation

• Location and Countries
• Cattle Sector Dynamics
  – Stocks and Production
  – Performance in Meat and Milk
  – Self-sufficiency
• Production systems and sector institutions
• Breeding Organisation
• Future needs in cooperation
## South East Europe Cattle Sector Dynamics

### Cattle, Stocks

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Number of Animals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>Bulgaria: 100.00%&lt;br&gt;Romania: 100.00%</td>
</tr>
<tr>
<td>2005</td>
<td>Bulgaria: 51.25%&lt;br&gt;Romania: 50.52%</td>
</tr>
</tbody>
</table>

(FAO 2006)
South East Europe
Cattle Sector Dynamics

Cow Milk, Milk Animals

<table>
<thead>
<tr>
<th>Country</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>37.14%</td>
<td>54.90%</td>
</tr>
<tr>
<td>Romania</td>
<td>40.92%</td>
<td>72.73%</td>
</tr>
</tbody>
</table>

(FAO 2006)
South East Europe
Cattle Sector Dynamics

Beef and Buffalo Meat, Production (tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>100,00%</td>
<td>18.59%</td>
</tr>
<tr>
<td>Romania</td>
<td>100,00%</td>
<td>65.01%</td>
</tr>
</tbody>
</table>

(FAO 2006)
South East Europe
Cattle Sector Dynamics

Cow Milk, Production (tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulgaria</td>
<td>100,00%</td>
<td>85,42%</td>
</tr>
<tr>
<td>Romania</td>
<td>100,00%</td>
<td>165,15%</td>
</tr>
</tbody>
</table>

(FAO 2006)
South East Europe
Cattle Sector Dynamics

Cattle Meat: self-sufficiency

(FAO 2006)

Bulgaria
Romania
South East Europe  
Cattle Sector Dynamics  

Cow Milk: self-sufficiency  

(FAO 2006)
South East Europe
Cattle Sector Dynamics

Beef and Buffalo Meat, (kg/Animal slaughtered)

(Bulgaria)
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South East Europe
Cattle Sector Dynamics

Cow Milk, Yield, kg/Animal milked

FAO 2006
South East Europe
Production systems and sector institutions

<table>
<thead>
<tr>
<th>Farm structure</th>
<th>Cooperatives</th>
<th>Commercial Companies</th>
<th>Individual Farms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Romania</td>
<td>0 / —</td>
<td>0,1 / 13</td>
<td>99,7 / 80</td>
</tr>
<tr>
<td>Bulgaria</td>
<td>0,4 / 51</td>
<td>0,3 / 23</td>
<td>99,3 / 26</td>
</tr>
</tbody>
</table>

IAMO, 2004
South East Europe
Production systems and sector institutions

- Dairy cows mainly kept by subsistence or small farms
  - Ø herd size 2 cows
- In large farms limited importance of cattle keeping
- Dominance of dual purpose cattle production

(IAMO, 2004)
South East Europe
Production systems and sector institutions

- Low labor and land productivity
- Low feeding system efficiency
  - poor summer pastures
  - inadequate feed conservation technologies
  - poor winter feeding

(IAMO, 2004)
South East Europe
Production systems and sector institutions

• Support institutions not adjusted to fit fragmented production system, these include
  – veterinary service
  – AI service
  – input supply
  – marketing
  – agricultural education
Product quality and food safety regulations

• Transformation and fragmented cattle sector creates problems for the implementation of EU regulations
South East Europe
Production systems and sector institutions

Product quality and food safety regulations

• Identification and Registration
  – legislation in process
  – implementation in process

• Health rules for dairy and beef products
  – legislation in process (Rom), completed (Bul)
  – lack of control infrastructure and enforcement
South East Europe
Production systems and sector institutions

Product quality and food safety regulations

• Product classification
  – Romania: none
  – Bulgaria: for beef meat legislation completed

• Feed control
  – Romania: none
  – Bulgaria: fully adjusted
Product quality and food safety regulations

- BSE Control
  - Romania: EU standards evaluated
  - Bulgaria: strict control

(IAMO, 2004)
South East Europe
Breeding Organisation

- Continuous importation of cattle breeding stock/semen
South East Europe
Breeding Organisation

Heifers, Head, 2005

- Bulgaria
  - Austria

- Romania
  - Netherlands
  - Italy
  - Hungary
  - France
  - Fr Germany
  - Denmark
  - Austria
South East Europe Breeding Organisation

Semen, Portions, 2005

- Romania: Netherlands, Italy, Hungary, France, Germany, Austria
- Bulgaria: France, Germany, Austria

0 2000 4000 6000
South East Europe
Breeding Organisation

Breeding Organisation Revitalization

• Breeding organisations: in process with assistance

• AI organisation: in process with assistance

• Performance recording: with limited scope

• BVE estimation/selection: with limited scope
South East Europe
Future needs in cooperation

• Land rental and purchasing incentives to overcome fragmentation
• Improved marketing structures (dairy)
• Overcoming low rate of mechanisation
• Re-establishment / adjustment of production advisory service and veterinary service

(IAMO, 2004)
South East Europe
Future needs in cooperation

- Establishment and management of breeding service (AI)
- Establishment of breeding herds (large farms) to produce cow bulls
Caucasian Countries

Georgia

Armenia

Azerbaijan
Caucasian Countries

Climate

- High ecological diversity
- High rainfall and subtropical climate near Black sea
- Dry and continental climate at the Caspian sea and in eastern plains
- Highlands: continental alpine climate with hot summers and cold winters
Caucasus
Cattle Sector Dynamics

Cattle, Stocks

<table>
<thead>
<tr>
<th></th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>100,00%</td>
<td>101,21%</td>
</tr>
<tr>
<td>Azerbaijan, Republic of</td>
<td>100,00%</td>
<td>130,91%</td>
</tr>
<tr>
<td>Georgia</td>
<td>100,00%</td>
<td>103,54%</td>
</tr>
</tbody>
</table>

1992 2005
Armenia 100,00% 101,21%
Azerbaijan, Republic of 100,00% 130,91%
Georgia 100,00% 103,54%
### Caucasus Cattle Sector Dynamics

#### Cow Milk, Milk Animals

<table>
<thead>
<tr>
<th>Country</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>44.33%</td>
<td>49.43%</td>
</tr>
<tr>
<td>Azerbaijan, Republic of Georgia</td>
<td>47.87%</td>
<td>72.85%</td>
</tr>
<tr>
<td>Georgia</td>
<td>44.95%</td>
<td>60.90%</td>
</tr>
</tbody>
</table>
Caucasus
Cattle Sector Dynamics

Beef and Buffalo Meat, Production
(tonnes)

<table>
<thead>
<tr>
<th></th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>100,00%</td>
<td>92,02%</td>
</tr>
<tr>
<td>Azerbaijan, Republic of</td>
<td>100,00%</td>
<td>141,74%</td>
</tr>
<tr>
<td>Georgia</td>
<td>100,00%</td>
<td>126,55%</td>
</tr>
</tbody>
</table>
### Caucasus Cattle Sector Dynamics

#### Cow Milk, Production (tonnes)

<table>
<thead>
<tr>
<th>Country</th>
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<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armenia</td>
<td>100,00%</td>
<td>142,12%</td>
</tr>
<tr>
<td>Azerbaijan, Republic of Georgia</td>
<td>100,00%</td>
<td>145,27%</td>
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<tr>
<td>Georgia</td>
<td>100,00%</td>
<td>204,99%</td>
</tr>
</tbody>
</table>
Caucasus
Cattle Sector Dynamics

Beef and Buffalo Meat, Carcass
Wt/Yield

- Armenia
- Azerbaijan, Republic of
- Georgia
Caucasus Cattle Sector Dynamics

Cow Milk, Yield, kg/Animal milked

- Armenia
- Azerbaijan, Republic of
- Georgia
Caucasian Countries
Production systems and sector institutions

Farm Structure (Azerbaijan)

- **Family farms:** 2 - 4 ha
  - owners often worked in kolkhoz during Soviet time,
  - but: Most family farms not economically viable

- **Small farming associations:** 5 to 400 ha
  - relatives and neighbours, from 100 - 400 persons
  - contracts for members, democratic structures
  - market orientation

(A.Kudat et al.)
Farm Structure (Azerbaijan)

- **Large farming associations:**
  - Modelled after kolkhoz with autocratic structure, 500 or more people
  - Only few large units, directed by former state farm directors
  - High influence in villages

(A.Kudat et al.)
Caucasian Countries
Production systems and sector institutions

Cattle Keeping

• Fully privatized livestock system
• Dominance of subsistence or smallholder cattle keeping
• Average herd size: 2 cows per farmer, mainly for milk production
• 50% of herds are dairy cows of Caucasian breeds with little breed improvement but adapted to harsh husbandry conditions

(Neidhardt 2006)
Caucasian Countries
Production systems and sector institutions

Average herd size (Georgia)

Classification of holdings by number of cattle (heads)
Caucasian Countries
Production systems and sector institutions

Azerbaijan

IntENSITY OF cattle production

% Low input Medium input High input

0 10 20 30 40 50 60 70 80 90

Subsistence Smallholder Small-scale comercial Large-scale comercial
Caucasian Countries
Production systems and sector institutions

Animal Husbandry (Azerbaijan)

• Most dairy processing factories stopped operating after reforms in agriculture

• Smallholder limited to subsistence production

• Few large cattle farms sell products
Caucasian Countries
Production systems and sector institutions

• Sector institutions not available for small farmers
  (e.g. Extension and veterinarian service, farm input supply, product marketing, agricultural education)

• Subsistence and smallholder farms lack adequate technical skills and means for input supply
  ⇣ Very low labour and land productivity
  Low husbandry standards and low performance
  Open access pastures (low quality)
  Inadequate feeding conservation and winter feeding
Caucasian Countries
Breeding Organisation

- Breakdown of organized cattle breeding due to fragmentation and low marketable output
- Usually natural mating on pastures → risks of degeneration → in Soviet times: artificial insemination common (Kosayev et al. 2001)
- No animal identification systems in place, no livestock figures available
- Concerted efforts required for:
  - adjusting breeding legislation
  - establishment and management of AI service
  - establishment of animal recording and breeding service
Caucasian Countries
Future needs in cooperation

– Formation of viable and effective sector institutions (policies, support institutions)
– Organisational options to overcome fragmentation and to enhance market oriented production (e.g. land rental or purchase)
– Extension and education to overcome low productivity and low product quality
– AI services to secure adequate genetic merit of cattle

→ Danger of G x E interaction through importation of high yielding genetic material
Central Asian countries

- Kazakhstan
- Turkmenistan
- Uzbekistan
- Tajikistan
- Kyrgyzstan
Central Asia

• Climate:
  – Dry and continental vast steppes and pastures, limited water (Kazakhstan, Uzbekistan, Turkmenistan),
  – Mountainous regions with continental climate (Tajikistan, Kyrgyzstan)
  – Extreme seasonal temperature variations → vertical transhumance
## Central Asia Cattle Sector Dynamics

### Cattle, Stocks

<table>
<thead>
<tr>
<th>Country</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kazakhstan</td>
<td>100,00%</td>
<td>57,03%</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>100,00%</td>
<td>86,97%</td>
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<tr>
<td>Tajikistan</td>
<td>100,00%</td>
<td>59,11%</td>
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<tr>
<td>Turkmenistan</td>
<td>100,00%</td>
<td>128,70%</td>
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<tr>
<td>Uzbekistan</td>
<td>100,00%</td>
<td>105,62%</td>
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Total number of animals
### Central Asia

**Cattle Sector Dynamics**

#### Cow Milk, Milk Animals

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<tr>
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<tr>
<td>Kazakhstan</td>
<td>38.53%</td>
<td>26.16%</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>42.18%</td>
<td>45.21%</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>36.03%</td>
<td>42.42%</td>
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<tr>
<td>Turkmenistan</td>
<td>46.33%</td>
<td>51.48%</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>41.47%</td>
<td>54.77%</td>
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Central Asia
Cattle Sector Dynamics

Beef and Buffalo Meat, Production (tonnes)

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<td>105,35%</td>
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<tr>
<td>Tajikistan</td>
<td>100,00%</td>
<td>58,54%</td>
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<tr>
<td>Turkmenistan</td>
<td>100,00%</td>
<td>217,39%</td>
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<tr>
<td>Uzbekistan</td>
<td>100,00%</td>
<td>139,19%</td>
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Central Asia
Cattle Sector Dynamics

Cow Milk, Production (tonnes)

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<td>100,00%</td>
<td>89,03%</td>
</tr>
<tr>
<td>Kyrgyzstan</td>
<td>100,00%</td>
<td>118,94%</td>
</tr>
<tr>
<td>Tajikistan</td>
<td>100,00%</td>
<td>95,73%</td>
</tr>
<tr>
<td>Turkmenistan</td>
<td>100,00%</td>
<td>297,24%</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>100,00%</td>
<td>114,16%</td>
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Central Asia
Cattle Sector Dynamics

Beef and Buffalo Meat, Carcass
Wt/Yield

- 50
- 100
- 150
- 200
- 250

Kazakhstan
Kyrgyzstan
Tajikistan
Turkmenistan
Uzbekistan

Central Asia
Cattle Sector Dynamics

Cow Milk, Yield, kg/Animal milked

Graph showing the cow milk yield in kg per animal for different countries: Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan over the years 1992 to 2004.
Central Asia
Production systems and sector institutions

• During Soviet Era:
  – major disruptions of traditional livestock systems between 1930’ and 1990’ \( \rightarrow \) collectivization, establishing of Kolkhozes

• After breakdown of USSR in the 1990’s:
  – liberalization and sector transition had severe impact on livestock systems (KAZ, KYR),
  – lesser impact in conservative countries (UZ, TURK, except TAJIK)
    Fragmentation of cooperatives lead to unproductive holdings / small flock sizes
  – collapse of markets lead to sale of animal stocks

  – massive stock realignment, creation of unviable livestock units

(Iniguez et al. 2004)
Central Asia
Production systems and sector institutions

• Transformation of institutional support infrastructure required
  – early degree of development for private small holder livestock keepers

• Renaissance of traditional grazing management (vertical transhumance) required

• Integration of smallholder cattle production with markets depends on respective policies

(Kijora et al. 2003)
Central Asia Breeding Organisation

- Collapsing of breeding programs:
  - indiscriminate crossing among breeds
  - disappearance of breeds
  - wrong targeting of breeding goals → low production
- Local cattle breeds have increasing importance in subsistence pasture based systems
Central Asia Breeding Organisation

- Crossbred (Brown Swiss, HF) and purebred imported dairy breeds in dairy systems
- Breading organization does not work properly
- Importation of breeding stock
- Importation of semen and distribution through AI services
Central Asia
Future needs in cooperation

- Detailed system analysis with participation of:
  - policy makers
  - farmers
  - other stakeholder
- Re-establishment of pastoral systems which allow transhumance
- Professional education and extension service
- Market infrastructure and input supply
Middle East
Middle East

• Ecological Conditions
  – Dry and hot
  – Low winter rainfall
  – Extensive rangeland/ steppe
## Middle East Cattle Sector Dynamics

### Cattle, Stocks

<table>
<thead>
<tr>
<th>Country</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran, Islamic Rep of</td>
<td>100,00%</td>
<td>127,54%</td>
</tr>
<tr>
<td>Jordan</td>
<td>100,00%</td>
<td>107,72%</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>100,00%</td>
<td>156,24%</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>100,00%</td>
<td>127,45%</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>100,00%</td>
<td>203,63%</td>
</tr>
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</table>

(FAO 2006)
## Middle East Cattle Sector Dynamics

### Cow Milk, Milk Animals

<table>
<thead>
<tr>
<th>Country</th>
<th>1992</th>
<th>2005</th>
</tr>
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<tbody>
<tr>
<td>Iran, Islamic Rep of</td>
<td>36,00%</td>
<td>57,97%</td>
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<tr>
<td>Jordan</td>
<td>60,80%</td>
<td>55,61%</td>
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<tr>
<td>Saudi Arabia</td>
<td>21,26%</td>
<td>45,26%</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>43,01%</td>
<td>64,44%</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>47,81%</td>
<td>97,39%</td>
</tr>
</tbody>
</table>
## Middle East Cattle Sector Dynamics

### Beef and Buffalo Meat, Production (tonnes)

<table>
<thead>
<tr>
<th></th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran, Islamic Rep of</td>
<td>100,00%</td>
<td>139,89%</td>
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<tr>
<td>Jordan</td>
<td>100,00%</td>
<td>206,52%</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>100,00%</td>
<td>81,43%</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>100,00%</td>
<td>165,42%</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>100,00%</td>
<td>174,11%</td>
</tr>
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</table>

(FAO 2006)
# Middle East
## Cattle Sector Dynamics

### Cow Milk, Production (tonnes)

<table>
<thead>
<tr>
<th>Jahr</th>
<th>1992</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iran, Islamic Rep of</td>
<td>100,00%</td>
<td>175,46%</td>
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<tr>
<td>Jordan</td>
<td>100,00%</td>
<td>193,16%</td>
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<tr>
<td>Saudi Arabia</td>
<td>100,00%</td>
<td>290,27%</td>
</tr>
<tr>
<td>Syrian Arab Republic</td>
<td>100,00%</td>
<td>161,13%</td>
</tr>
<tr>
<td>United Arab Emirates</td>
<td>100,00%</td>
<td>206,07%</td>
</tr>
</tbody>
</table>

(FAO 2006)
Middle East Cattle Sector Dynamics

Beef and Buffalo Meat, Carcass Wt/Yield

Iran, Islamic Rep of
Jordan
Saudi Arabia
Syrian Arab Republic
United Arab Emirates

(FAO 2006)
Middle East Cattle Sector Dynamics

Cow Milk, Yield, kg/Animal milked

- Iran, Islamic Rep of
- Jordan
- Saudi Arabia
- Syrian Arab Republic
- United Arab Emirates

(FAO 2006)
Cattle Sector

- **Smallholder farms** with variable herd size
- **Large, market oriented farms**

  e.g. Syria
  - private smallholders: 1-3 cows
  - medium sized dairy farms: <15 cows
  - cooperatives: >15 cows
  - state farms & private companies: 100-400 cows
Middle East
Production systems and sector institutions

Cattle Sector

• Dual purpose cattle
  – in smaller cattle farms with
  – local breeds, crossbreds, purebred exotic breeds
Middle East
Production systems and sector institutions

Cattle Sector

- Production efficiency depending on
  - feed quality
  - feed availability

highly variable
Middle East
Production systems and sector institutions

Dairy Production Efficiency in Syria

- % of Milk production
- % of Cow stock

- 1-3 Cows
- 3-7 Cows
- 8-12 Cows
- 15 Cows
- >15 Cows
- >100 Cows
Middle East
Production systems and sector institutions

- Intensive large dairy farms
  - in oil rich countries based on irrigated fodder production and high-tech husbandry → high yields
  - purebred exotic breeds
- High opportunity cost of rearing breeding stock
Middle East Breeding Organisation

- Importation of pregnant heifers, breeding cows and bulls
- Implementation of A. I. service based on
  - imported Bulls for local semen production
  - imported semen
- Implementation of crossbreeding (upgrading) programs for smallholder dairy systems
Middle East Breeding Organisation

Semen, 1000 €, 2005

U.A. Emirates
Saudi Arabia
Jordan
Iran

EuroStat, 2006
Performance of different genotypes from crossbreeding studies

- 100% Friesian
- 93.75% HF
- 87.5% HF
- 75% HF
- 50% HF
- Local

Middle East Breeding Organisation

Milking Performance [kg]
Middle East Breeding Organisation

• G x E interactions → less intensive systems
• Other breeding programme essentials seldom implemented
  – identification, registration (herd book)
  – systematic performance recording
  – breeding value estimation
  – selection of breeding animals for sire production
Future activities for collaboration

• Improved system analysis
• Defining sustainable breeding goals for diverse dairy production systems
• Efficiency of AI systems and utilisation of imported cow bulls
• Monitoring of production efficiency to secure well being of imported breeding stock
Conclusions for cattle sector development

1. Low production intensity favours dual purpose breeds with medium yield level

2. Dairy production more important than beef

3. Build-up of support institutions for dairy sector has high priority

4. Production quality requires vast improvement importance
Conclusions for cattle sector development

5. Re-establishment of breeding service (A.I.) is starting point

6. Re-organisation of Breeding Associations and breeding programs important but difficult

7. Importation of key genetic for direct use or establishment of nucleus breeding herds to produce bulls likely to be best option

8. High opportunity cost for fodder leads to continuous importation of herd replacement from western dairy countries

9. Systematic analysis of whole production sector required