Portuguese dairy farming systems

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Importance of the dairy sector in Portuguese agriculture

- Cereals: 4%
- Forage crops: 5%
- Fruits: 17%
- Vegetables: 17%
- Animal meat: 30%
- Milk: 11%
- Wine: 6%
- Eggs: 2%
- Other agricultural activities: 5%
- Other crop products: 1%
- Potato: 2%

% of agricultural output (2013)
Milk deliveries, quota and number of producers (1993 - 2012)

Source: Cardoso (2014)
Degree of self-sufficiency of Portugal's dairy products

- Cheese: 75%
- Yoghurt: 51%
- Milk and Cream: 108%
- Dairy products (whole): 94%

Percentage
Main portuguese regions of milk production

Production by region (as % of total)

Azores Islands

Other regions; 20

NW Region; 50

Azores; 30

Total portuguese production (2013): ≈ 1.9 million t

Source: www.ine.pt
Main portuguese regions of milk production

Climatic conditions

Azores
Ponta Delgada

- Annual rainfall: 985 mm
- 70% from Oct to April

Mainland

- Annual rainfall: 1 150 mm
- 80% from Oct to April
Azores

NW region mainland
Azores dairy system – main characteristics

Permanent grasslands grazed all around the year

- Low altitude
- High altitude (>800 m)
- 10 -15 t DM / yr

Small farms

- 21 ha (21 blocks)
- 31 dairy cows (< 1.5 cows / ha)
- 195 t milk / yr

6 300 L milk /cow /yr

0.2 kg concentrate feed (/L milk)
Mobile milking parlours

http://mw2.google.com/mw-panoramio/photos/medium/59989758.jpg
20% of the farm income is from beef production
Mainland NW dairy system – main characteristics

**Zero grazing system**

**Two silage crops / year**
- Maize (20 to 24 t DM / ha)
- Annual ryegrass (7 - 9 t DM / ha)

**High stocking rates 5-7 LSU / ha**

**High production per cow (> 9 000 L / yr)**

**0.3 – 0.4 kg concentrate feed (/L milk)**

**Production of 35 to 50 t milk / ha**
Mainland NW dairy system – main characteristics

High amounts of slurry to apply or to process

- Maize at sowing
- Annual ryegrass at sowing
- Annual ryegrass topdressing

Topdressing of slurry to ryegrass (end of winter)
Mainland NW dairy system – main characteristics

- Maize silage: 30 – 35 kg/cow/day
- Hay or straw: 1 – 2 kg/cow/day
- Concentrate feed: 7 kg/cow/day

(plus a cow specific supplement according to production level)
## NPK balance in intensive NW dairy farms (kg ha\(^{-1}\))

<table>
<thead>
<tr>
<th></th>
<th>Árvore Farm</th>
<th>Junqueira Farm</th>
</tr>
</thead>
<tbody>
<tr>
<td>L milk/ha/yr (L /cow)</td>
<td>(23\ 256\ (9\ 615))</td>
<td>(55\ 136\ (9\ 700))</td>
</tr>
<tr>
<td><strong>Inputs (I)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentrate feed</td>
<td>273</td>
<td>842</td>
</tr>
<tr>
<td>Mineral fertilizers</td>
<td>92</td>
<td>143</td>
</tr>
<tr>
<td>Animals</td>
<td>0.0</td>
<td>5</td>
</tr>
<tr>
<td>Straw and other forages</td>
<td>10</td>
<td>18</td>
</tr>
<tr>
<td>Water</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Inputs (I)</strong></td>
<td>395</td>
<td>1028</td>
</tr>
<tr>
<td>Milk</td>
<td>127</td>
<td>316</td>
</tr>
<tr>
<td>Animals</td>
<td>13</td>
<td>29</td>
</tr>
<tr>
<td>Sold forages</td>
<td>17</td>
<td>-</td>
</tr>
<tr>
<td><strong>Outputs (O)</strong></td>
<td>157</td>
<td>345</td>
</tr>
<tr>
<td>Balance (Surplus)</td>
<td>238</td>
<td>683</td>
</tr>
<tr>
<td>Excesso/L leite (kg/(10^3) L)</td>
<td>10.2</td>
<td>12.4</td>
</tr>
<tr>
<td>NUE (O/I, %)</td>
<td>40</td>
<td>34</td>
</tr>
</tbody>
</table>

**Notes:**
- Concentrate feed units: kg/ha/year (kg/cow)
- Mineral fertilizers units: kg/ha/year (kg/cow)
- Animals units: kg/ha/year (kg/cow)
- Straw and other forages units: kg/ha/year (kg/cow)
- Water units: kg/ha/year (kg/cow)
- Milk units: L/ha/year (L/cow)
- Animals units: kg/ha/year (kg/cow)
- Sold forages units: kg/ha/year (kg/cow)
- Outputs (O) units: kg/ha/year (kg/cow)
- Balance (Surplus) units: kg/ha/year (kg/cow)
- Excesso/L leite (kg/\(10^3\) L) units: kg/ha/year (kg/cow)
- NUE (O/I, %) units: %
N fluxes in Portuguese Intensive dairy farms (kg N ha\(^{-1}\) y\(^{-1}\))

**Total inputs:** 580

- **Concentrates:** 390, 40% (460, 60%)
- **Forage:** 850
- **Fertilizers:** 120
- **Effluents:** 459

**Milk (196):** 23%

**NH\(_3\) (78):**
- Volatilization

**Nitrogen gases:**
- N\(_2\), NO e N\(_2\)O (30)
- N\(_2\)O (4)

**Instalações:** 656

**Armazenamento:** 578

**Leaching (160)**
Strong points of milk sector

- High crop yielding potential
- Well organized regional milk industry
- Support from dairy cooperatives
<table>
<thead>
<tr>
<th>Weak points of milk sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size and structure of farms; land price</td>
</tr>
<tr>
<td>Industry limited capacity for price negotiation</td>
</tr>
<tr>
<td>Peripheral status of Portugal relatively to major markets (Azores)</td>
</tr>
<tr>
<td>Poor technical management of the farms and herds (in Azores)</td>
</tr>
<tr>
<td>High Production costs</td>
</tr>
<tr>
<td>High demanding rules in terms of food security, environment, animal welfare and licensing</td>
</tr>
</tbody>
</table>
Breakdown of expenditure in Azores dairy farms

- Purchased Feeds: 27%
- Depreciations: 13%
- Renting: 11%
-Labour: 6%
- Depreciations: 13%
- Renting: 11%
- Labour: 6%
- Other: 19%
- Vet. Services: 2%
- Maintenance: 6%
- Fuels: 6%
- Fert. & Pesticides: 10%
Breakdown of expenditure in NW dairy farms

NW region

- Purchased Feeds: 49%
- Fert. & Pesticides: 3%
- Labour: 6%
- Depreciations: 7%
- Renting: 5%
- Vet. Services: 6%
- Other: 24%
Final Remarks / Conclusions (1/2)

End of quota system

Milk prices

Improve technical management of farms and herds

- Reduction of costs
- Solutions for environmental problems
Innovation and diversification: dairy products with added-value for external and internal markets

- Cheese
- Yoghurt

Increasing exports and strengthening the internationalization

- Morocco, Angola, ….
- New markets

Final Remarks / Conclusions (2/2)

### Trade Balance (Exports-Imports) 2013

<table>
<thead>
<tr>
<th>Products</th>
<th>Tons</th>
<th>M Euros</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh milk and cream</td>
<td>69 705</td>
<td>22.1</td>
</tr>
<tr>
<td>Concentrated milk and cream</td>
<td>-9 546</td>
<td>-6.4</td>
</tr>
<tr>
<td>Yoghurt</td>
<td>-119 743</td>
<td>-135.4</td>
</tr>
<tr>
<td>Whey</td>
<td>8 008</td>
<td>-4.5</td>
</tr>
<tr>
<td>Butter</td>
<td>2 757</td>
<td>17.3</td>
</tr>
<tr>
<td>Cheese</td>
<td>-31 746</td>
<td>-110.9</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>-80 564</td>
<td>-217.8</td>
</tr>
</tbody>
</table>
Thank you