LIVESTOCK FARMING, HIGH-QUALITY CHEESE AND TERRITORY

Luisa Antonella Volpelli
In the near future, we’ll have to face a **growing demand for food**

The modification of the diets in Developing Countries will result in increased intake (in % calories) of **animal products** higher than that of **vegetable products** (Fogel, 2004)

<table>
<thead>
<tr>
<th></th>
<th>1964-66</th>
<th>1997-99</th>
<th>2030</th>
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</thead>
<tbody>
<tr>
<td>meat</td>
<td>10</td>
<td>26</td>
<td>37</td>
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<tr>
<td>milk &amp; dairy</td>
<td>28</td>
<td>45</td>
<td>66</td>
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<tr>
<td>grain pulses</td>
<td></td>
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<td>tubers sugar</td>
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<td>small variations</td>
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In particular, the expected annual per capita intake of meat and milk from 1980 to 2030, according to FAO, 2006.

**Meat**
- 1980: 14 Kg (Developed Countries), 73 Kg (Developing Countries)
- 1990: 18 Kg (Developed Countries), 80 Kg (Developing Countries)
- 2002: 28 Kg (Developed Countries), 78 Kg (Developing Countries)
- 2015: 32 Kg (Developed Countries), 83 Kg (Developing Countries)
- 2030: 37 Kg (Developed Countries)

**Milk**
- 1980: 34 Kg (Developed Countries), 195 Kg (Developing Countries)
- 1990: 38 Kg (Developed Countries), 200 Kg (Developing Countries)
- 2002: 46 Kg (Developed Countries), 202 Kg (Developing Countries)
- 2015: 55 Kg (Developed Countries), 203 Kg (Developing Countries)
- 2030: 66 Kg (Developed Countries)

*G. Pulina et al., AISSA, 2010*
Just some points for thinking...

Is animal breeding really so harmful for the planet and the human population?

Really ruminants pollute as (or more ...) industry?
Source: IPCC (2007); based on global emissions from 2004.
Details about the sources included in these estimates can be found in the Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change.
Italy: the responsibility of the sources for greenhouse gas emissions

Agriculture
2007 → 6.7%
2009 → 7.0%

ISPRA, National Inventory Report, 2009 and 2011; G. Ballarini, UNIPR, 2011
Italy: contribution of animal production to total greenhouse gas emissions (ISPRA, 2010)

GHG emissions from agriculture: 6% of total

Animal production: 3%
Other: 97%

Ministry of Agriculture and Forestry (MiPAAF), Institute for the Protection and Environmental Research (ISPRA): “…it is now clear how livestock responsibility in environment issues is negligible or minimal, whilst taking a different weight the contribution of other sources, in particular minerals” (“georgofili.info”, June 11, 2014)

SO
May we say that livestock farming IS NOT the first responsible (and not even the second……) for the troubles of the planet?
So......

Food Safety and Sustainable Livestock Farming

- people need animal products

- improve efficiency, particularly:
  - disease resistance
  - improve welfare
  - animal feeding not competitor with human diet

- make possible the transfer of good technologies to the users, especially in developing Countries, at acceptable costs

- improve the link between vegetal and animal production, between livestock farming and the territory
I’d like to speak of two beautiful reality of our land...
Two different ways of producing one of the most famous cheese in the world

Parmigiano – Reggiano Cheese
A LINK BETWEEN PAST AND FUTURE

Un manto dal colore del grano alla fonte del Parmigiano Reggiano

REGGIANA OR “ROSSA” BREED
“A WHEAT-COLOUR COAT AS THE SOURCE OF PARMIGIANO-REGGIANO”

MODENESI OR BIANCA VALPADANA BREED
Let's start with "rossa" reggiana.

www.razzareggiana.it
ROSSA REGGIANA... FROM PAST TO PRESENT

• In the Po Valley since VII century A.D., Longobard Benedictine monks, year 1000, the first “Caci Parmigiani” rose

• The maximum of the race was the first half of '900, when in the Provinces of Reggio and Parma the heads were about 140,000

• Then a heavy crash occurred, mainly in 1950/1980, when it was declared endangered

• Cattle Breeders National Association of Reggiana (ANABoRaRe), born in 1956

• In the late '80s, the Catellani family began a work of recovery, involving other farmers and institutions
1991: C.V.P.A.R.R. (Consortium Enhancement Products Ancient Breed Reggiana), on the initiative of the Catellani family and a small group of breeders; the first "one breed" wheel is produced

Today: "Consorzio Vacche Rosse S.C.A.", the only cheese plant producing cheese from Reggiana milk exclusively

At start → 6 members - 2,100 q/year milk – 400 wheels

Today → 32 members – 50,000 q/year milk – 9,400 wheels

Price paid to producers is well above average market prices for Parmigiano-Reggiano
Price of cheese for consumers is also higher, and the cheese is very demanded
THE MILK OF ROSSA REGGIANA

More **casein**, particularly “B” types of β and κ, providing smaller and more abundant micella

Thicker curd at start
trapping the maximum quantity of milk components

**Higher milk yield**

More “elastic” curd
More complete expulsion of whey

Reducing the occurrence of undesired fermentation
Better pathway of ripening of the cheese

**Rheology**

⇒ shorter clotting time “r”
⇒ shorter curd firming time “k_{20}”
⇒ higher curd firmness “a_{30}”
The cheese made from Reggiana milk can be recognized through two brands in addition to those of Parmigiano-Reggiano. Both are under the control of the same rules of production.

Traceability

the number reported on the plaque of casein, one for each wheel of cheese, lets you know who made the cheese.
Rules for producing “Vacche Rosse” Parmigiano – Reggiano cheese

All the rules of Consorzio Parmigiano - Reggiano and

- Total Mixed Ration ("unifeed") forbidden

- **Green forages and hay** → at least 50% self-produced
  → at least 90% from the P-R territory

- Provide green forages as far as possible

- **Concentrate feeds**
  → not more than 50% of the ration
  → GMO-free certified
Production of P-R wheels from Reggiana milk

Processed milk from Reggiana (q) for P-R cheese

www.razzareggiana.it
The “pioneer” farm, where the rebirth of the breed and of the “red cow cheese” started
Marketing is important...made by people, passion, mind
... AND MODENESE - BIANCA
VAL PADANA BREED

www.consorziobiancamodenese.it
Modenese – Bianca Val Padana Breed

Early '900: the total size of the breed was probably about 200,000 heads

1957 → National Herd Book, but the breed was already in decline

2005 → reduced to about 800 heads

Breeders and their Association, the Province of Modena, Slow Food project for the recovery and enhancement of Bianca Modenese

production of Parmigiano-Reggiano with only "White“ milk

the first wheel is produced on April 4, 2005

2006 In Zocca (Modena) → Consorzio Valorizzazione Prodotti Bovini di Razza Bianca Valpadana-Modenese

www.consortziobiancamodenese.it
Some data (2014)..... A comparison with Frisona, high producing breed

<table>
<thead>
<tr>
<th></th>
<th>FARMS n.</th>
<th>COWS n.</th>
<th>MILK kg</th>
<th>FAT %</th>
<th>PROTEIN %</th>
<th>Cows per farm n.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frisona</td>
<td>12,036</td>
<td>1,099,342</td>
<td>9,293</td>
<td>3.71</td>
<td>3.32</td>
<td>91</td>
</tr>
<tr>
<td>Reggiana</td>
<td>200</td>
<td>2600</td>
<td>5,557</td>
<td>3.54</td>
<td>3.45</td>
<td>33</td>
</tr>
<tr>
<td>Modenese</td>
<td>50</td>
<td>700</td>
<td>5,165</td>
<td>3.26</td>
<td>3.47</td>
<td>22</td>
</tr>
</tbody>
</table>

**Reggiana and Modenese vs Frisona**

- Casein, total and % of total protein: HIGHER
- Titratable acidity: HIGHER
From feedback of farmers (EURECA, 2010)

Reggiana vs Frisona
MORE profit, rusticity, longevity, fertility
LESS production, need, docility

Modenese vs Frisona
MORE rusticity, longevity, fertility
LESS profit, production, need, docility
Reggiana and Modenese farmers say that only the farmers of cosmopolitan cattle breeds have a negative opinion.
The majority of society have a positive opinion.
THANK YOU FOR YOUR ATTENTION

Joseph Rotblat, Nobel Peace Prize, 1995
Ricordatevi della vostra umanità, e dimenticate il resto
Remember your humanity, and forget the rest