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**University of Modena and
Reggio Emilia
Department of Life Science**



LIVESTOCK FARMING, HIGH-QUALITY CHEESE AND TERRITORY

Luisa Antonella Volpelli



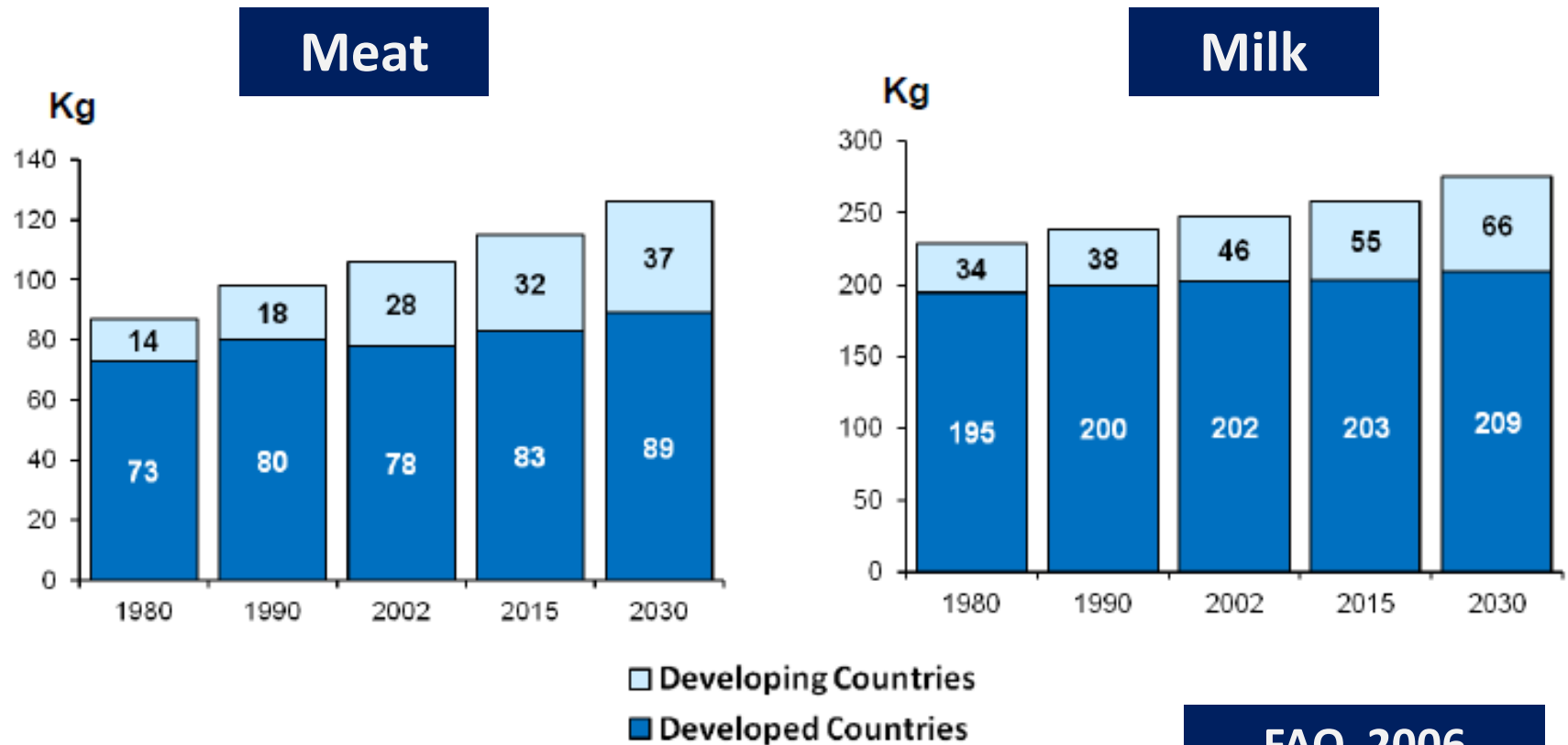
In the near future, we'll have to face a **growing demand for food**

	1964-66	1997-99	2030
meat	10	26	37
milk & dairy	28	45	66
grain pulses tubers sugar	small variations		

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)

G. Pulina et al., AISSA, 2010

In particular..... expected annual per capita intake of meat and milk 1980 - 2030



FAO, 2006

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?



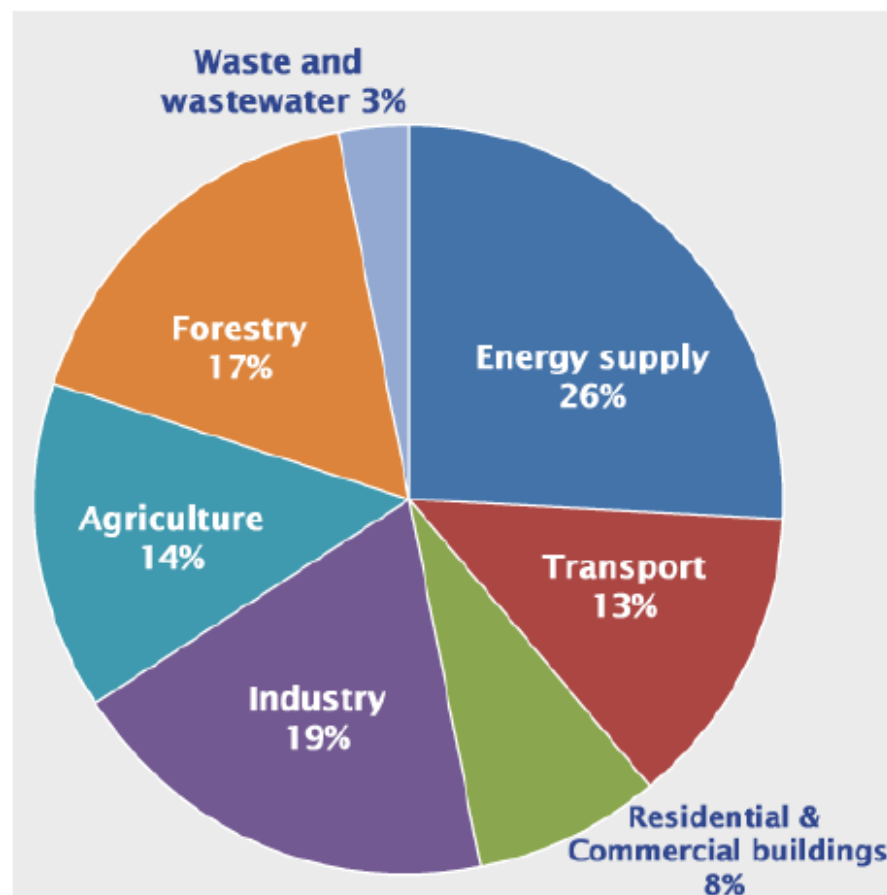
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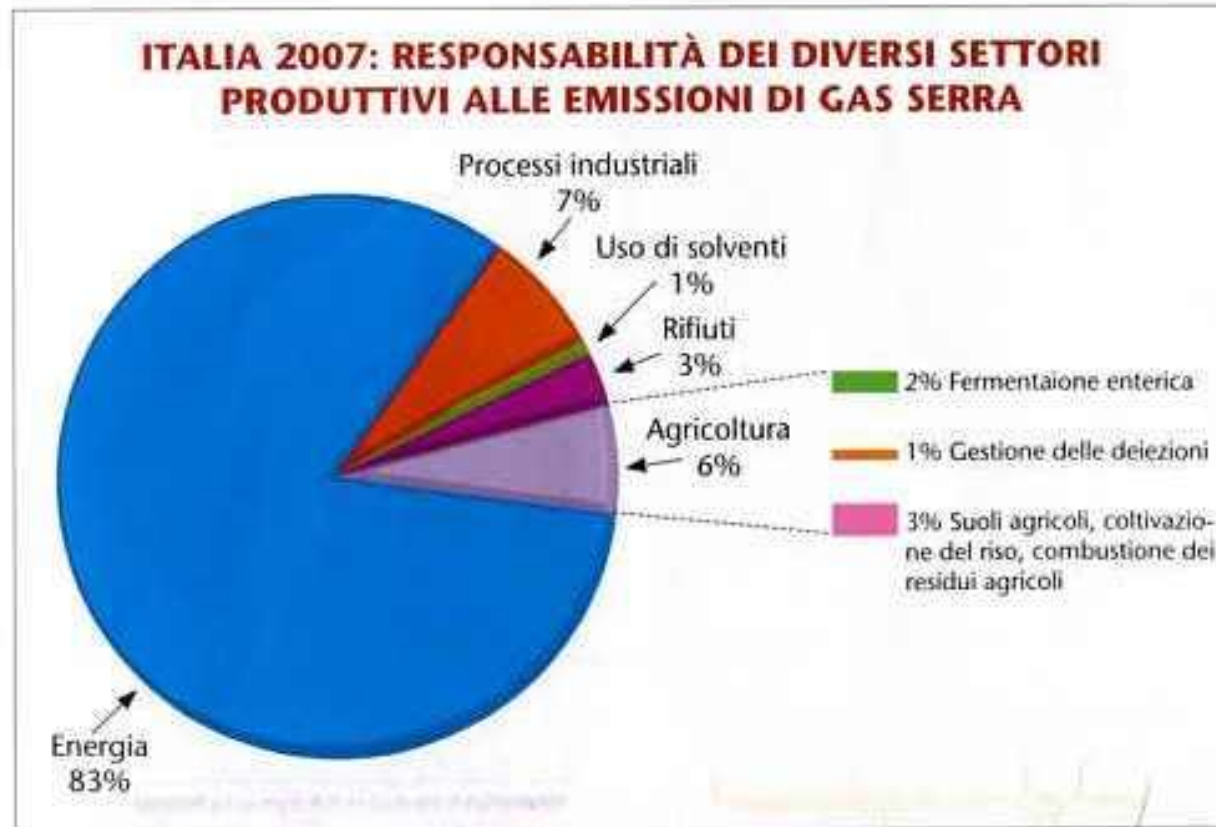
?



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

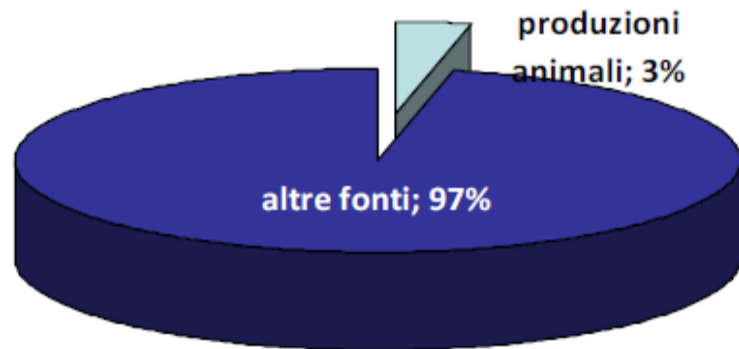


Fonte: ISPRA, NIR 2009

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)



Animal production: 3%

Other: 97%

GHG emissions from agriculture: 6% of total

G. Pulina *et al.*,
2010

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*

MODENESE OR BIANCA
VALPADANA BREED

REGGLANA OR "ROSSA" BREED
**"A WHEAT-COLOUR COAT AS THE
SOURCE OF PARMIGIANO-REGGIANO"**



LET'S START WITH "ROSSA" REGGLIANA..



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



CONSORZIO VACCHE ROSSE

- **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 \Rightarrow shorter clotting time “ r ”
 \Rightarrow shorter curd firming time “ k_{20} ”
 \Rightarrow higher curd firmness “ a_{30} ”



**The two
identifying
marks of
Parmigiano
Reggiano
from
Reggiana
breed**



**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

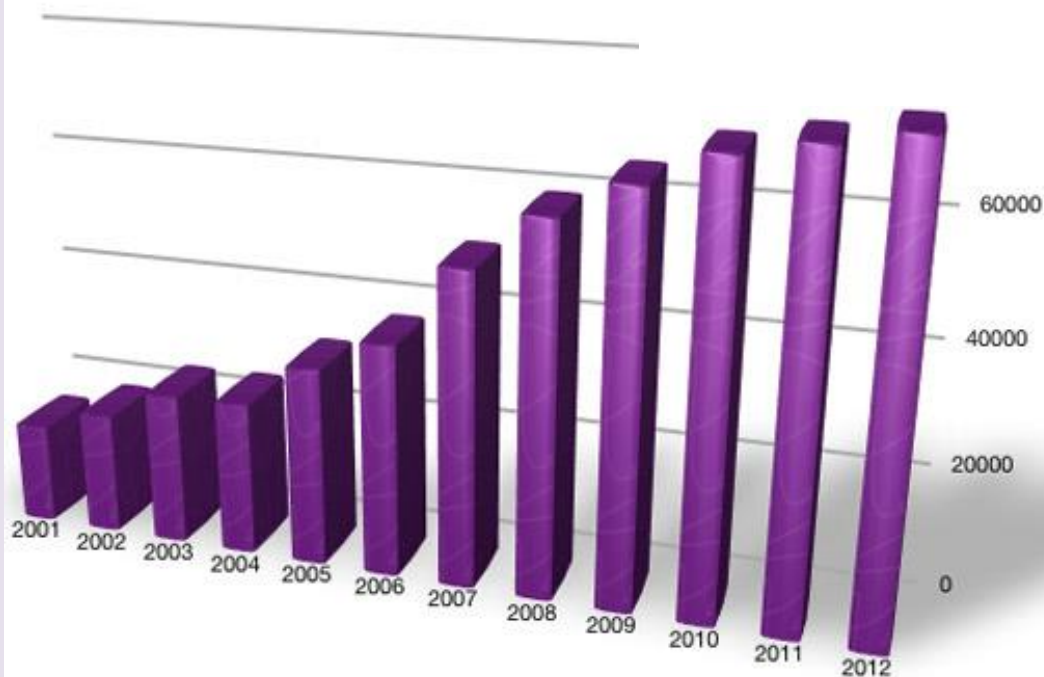
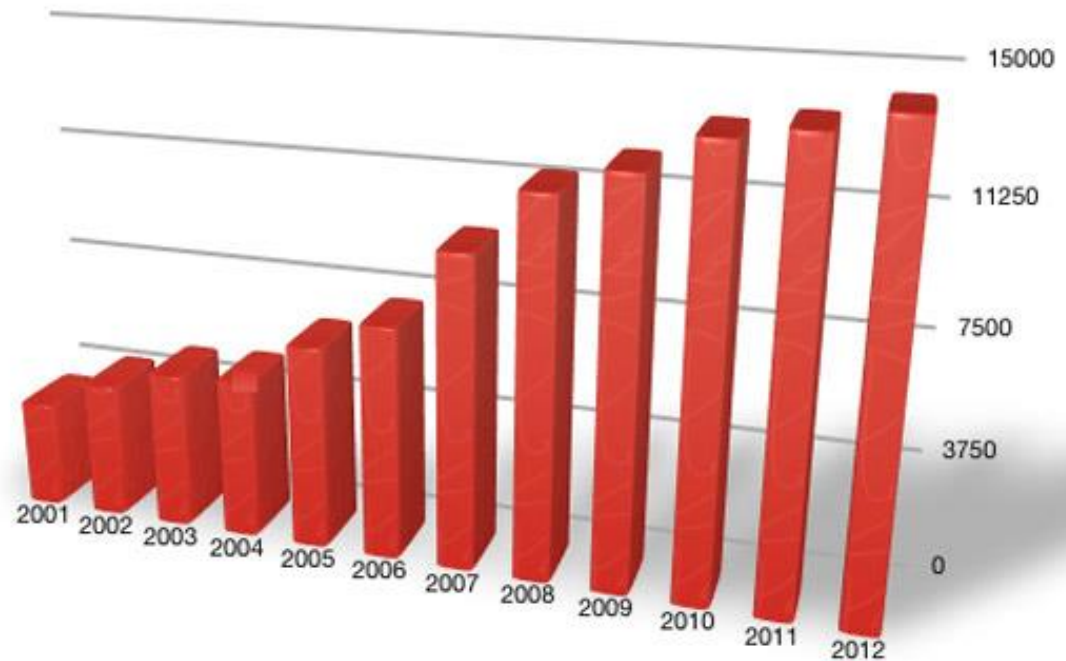
Rules for producing “Vacche Rosse” Parmigiano – Reggiano cheese

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

Grana d'Oro Farm Cavriago (RE)



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.consorziobiancamodenese.it

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

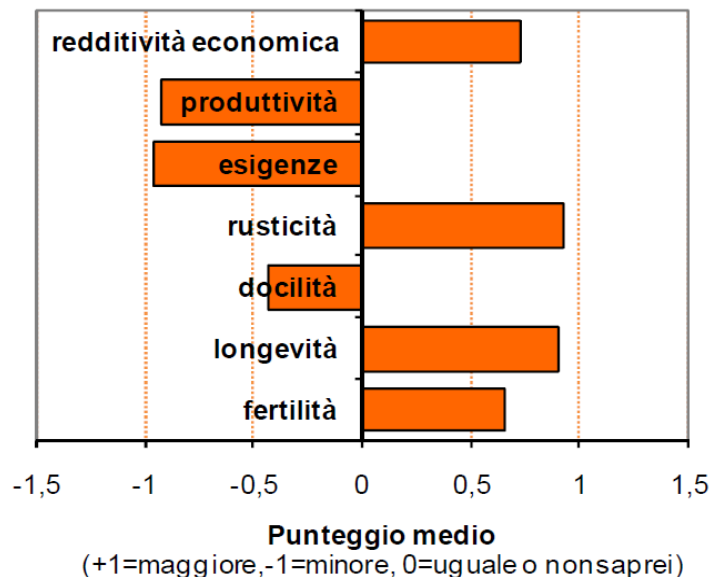
	FARMS n.	COWS n.	MILK kg	FAT %	PROTEIN %	Cows per farm n.
Frisona	12,036	1,099,342	9,293	3.71	3.32	91
Reggiana	200	2600	5,557	3.54	3.45	33
Modenese	50	700	5,165	3.26	3.47	22

Reggiana and Modenese vs Frisona

Casein, total and % of total protein HIGHER

Titratable acidity HIGHER

Confronto Reggiana - Frisona



Reggiana vs Frisona

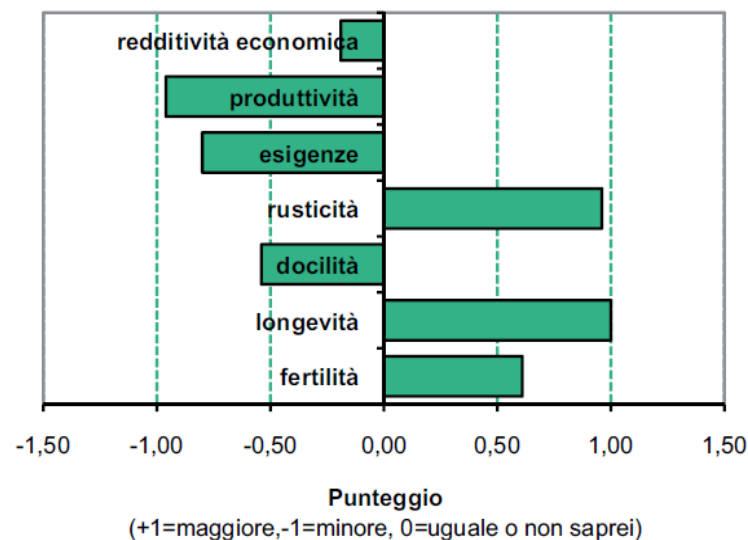
MORE profit, rusticity, longevity, fertility

LESS production, need, docility

Modenese vs Frisona

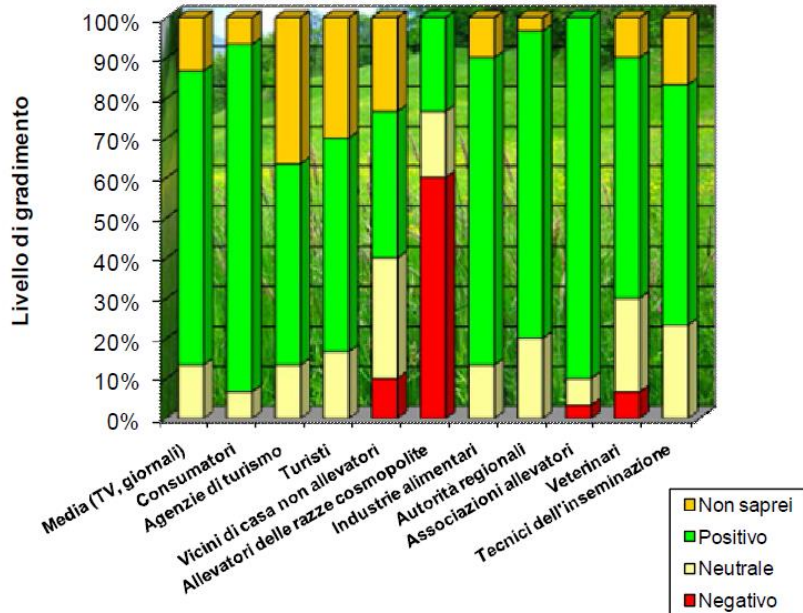
MORE rusticity, longevity, fertility
LESS profit, production, need, docility

Confronto Modenese - Frisona



From feedback of farmers (EURECA, 2010)

Il parere della società



Reggiana and Modenese farmers say that only the **farmers of cosmopolitan** cattle breeds have a negative opinion

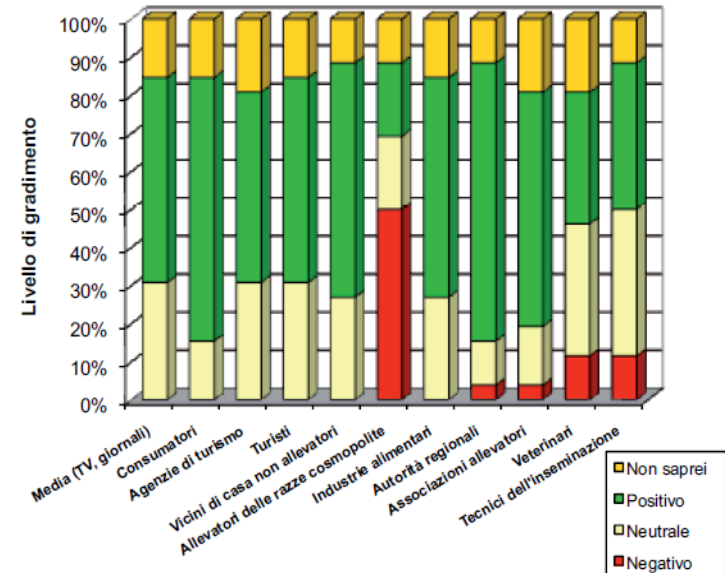
The **majority of society** have a positive opinion



REGGIANA

MODENESE

Il parere della società



What farmers think about the opinion of the society on Reggiana and Modenese breeds (EURECA, 2010)

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