Present situation and future challenges of beef cattle production in Italy and the role of the research

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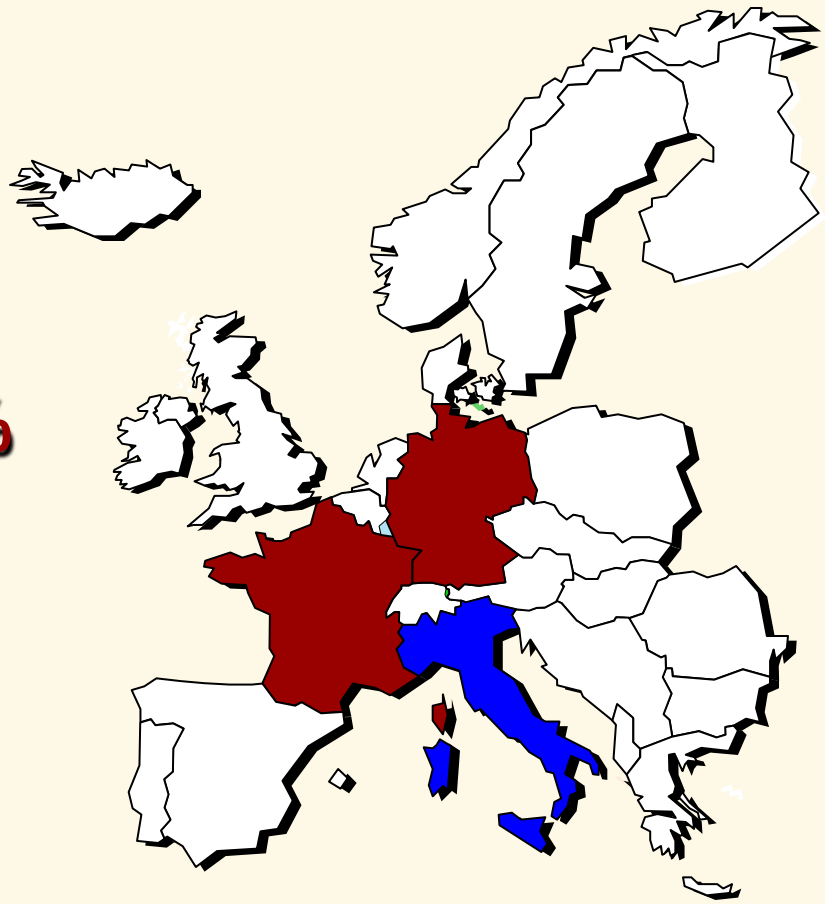
The Italian beef cattle production in the European scenario

(OFIVAL, 2007)

- France 22,5%
- Germany 15,3%
- Italy 11,4%



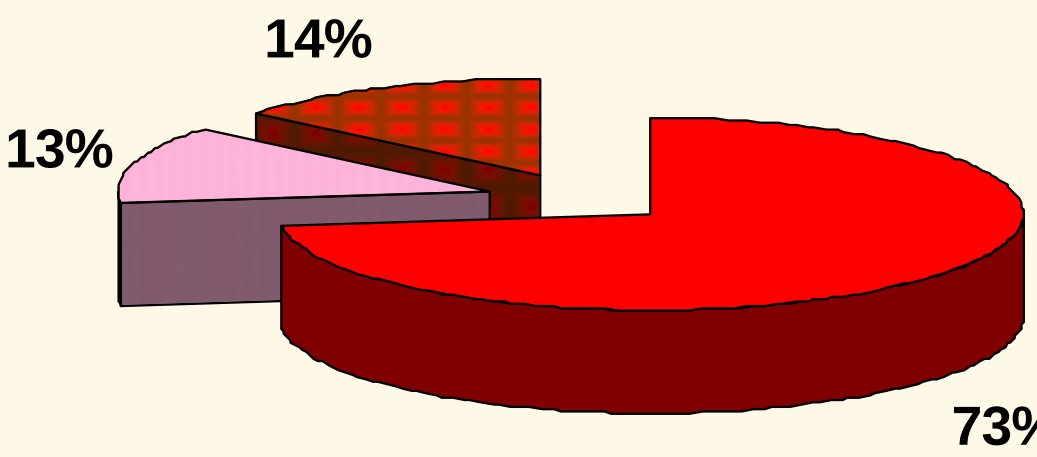
Main categories of cattle slaughtered for meat production in Italy in the year 2005

(Source: modified from ISTAT, 2007)

	Heads (000)	Average live weight (kg)	Dressing out (%)
Veal calves	988	243	59.2
Young bulls	1.949	583	58.2
Beef heifers	565	457	56.3
Culled cows	541	557	46.7

National self-supply for cattle meat: 63%

(CRPA, 2006)

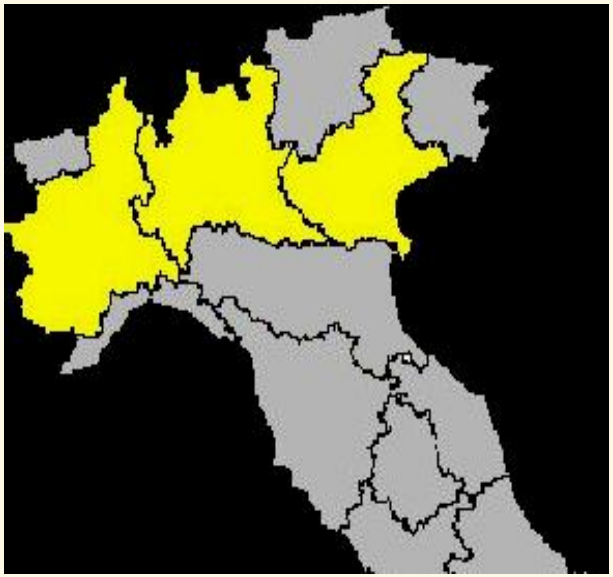


(ISMEA, 2006)

The production systems

Veal calves

Farm location	%
Veneto	40
Lombardy	40
Piedmont	10



Farm size: 500-600 calves ± 500. (From 100 to > 2000).

(Cozzi et al., 2003)

Stocking rate: ????

Veal calves

Animals

Breed	Source	%
Holstein & Brown ♂	National	77
Holstein & Simmental	Imported (PL, F, D)	23

Group housing in multiple pens (Dir 97/2/EC)

Feeding plan: milk replacer + small amount of roughage (Dir 97/2/EC)

Fattening young bulls

Farm type and location

Rearing system	Cattle population	Farm location
Intensive	70-75%	Po Valley
Extensive	25-30%	Piedmont & Central regions

Fattening cycle and stocking rate in a sample of different Italian beef cattle farms

(Source: ISMEA, 2006)

Type of farm		Intensive		Extensive
Farm location		Veneto	Piedmont	Tuscany
Cattle breed		Charolais & FC[x]	Blonde d'Acquit.	Chianina
Farm size	heads	1320	380	28
Cattle live weight:				
Initial	kg	368	237	257
Final	kg	641	597	722
Daily gain	kg/d	1.30	1.39	1.25
Cycle duration	d	210	260	372
Stocking rate	LU/ha[y]	7.0	4.5	1.2

[x]FC = French crosses; [y]LU/ha = Livestock Units/hectare.

Intensive farms

Animals

Strong dependence on imported cattle

- 1.000.000 heads imported in the year 2005
- 80% from France (Charolais, Limousin + Crossbreds)
- 20% from Eastern Europe (Polish Friesians and Simmental).

Housing systems

- Indoor loose housing in multiple pens on littered or slatted floor pens

Feeding plan

- High concentrate diets with small amounts of roughage fed as Total Mixed Ration. Maize as main feed crop and energy source

Extensive farms

Animals

- Young bulls of Italian beef breeds: Piemontese, Chianina, Marchigiana, Maremmana, Podolica, Romagnola

Housing systems

- Loose housing in small multiple pens or tied stalls on permanent bedding indoor

Feeding plan

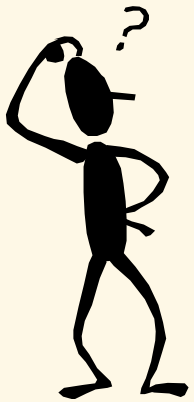
- Concentrates top-dressed to the forage portion in which maize silage is replaced by luzerne and meadow hays. Energy from cereal grains and protein from luzerne hay, field beans and soybean

The future challenges and the role of the research

Main critical points of the Italian beef cattle production

- ✓ Environmental impact
- ✓ Dependence on imported cattle
- ✓ Need for new feeding strategies
- ✓ Animal welfare

The environmental impact of beef cattle farms



Problem:

- To comply with the Nitrate Directive 91/676/EC

Proposed solutions:

- downsize the farm stocking rate
- reduce dietary crude protein

Performance and nitrogen excretion of steers fed diets with different crude protein concentration during the finishing period

		Dietary crude protein		Δ 12/14
		12% DM	14% DM	
Initial live weight	kg	404	404	
Final (FLW)	kg	496	517	- 4.1%*
Average daily gain	kg/d	1.64	2.02	- 18.8%*
Days of trial	d	56	56	
N intake	g/d	198	240	- 17.6%**
Excreted N	% of N intake	88.7	88.9	- 0.2%
Total N excreted	g	9820	11938	- 17.7%**

*P < 0.10; **P < 0.05.

(Source: modified from Cole et al., 2003)

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Additional days on feed[1]	d	13	--	
Total N excreted to equalize FLW	g	12004	11938	0.6%

*P < 0.10; **P < 0.05.

[1]Days required by the steers fed 12% CP to reach the same final live weight of 14% CP steers.

(Source: modified from Cole et al., 2003)

The scientific research

Mission

To identify strategies to increase the efficiency of N retention

Technical solutions:

Veal calves

Improve knowledge on true digestibility & efficiency of absorption of dietary essential aminoacids

Essential amino acid composition of tissue protein and ruminal bacteria

	Tissue protein	Ruminal Bacteria
	----- g/100 g of protein ----	
Methionine	2.7	2.6
Lysine	7.6	7.9
Histidine	2.7	2.0
Phenylalanine	4.8	5.1
Threonine	3.7	5.8
Leucine	9.2	8.1
Isoleucine	5.8	5.7
Valine	5.9	6.2
Arginine	3.4	5.1

(Source: modified from O'Connor et al., 1993)

The scientific research

Mission:

To identify strategies to increase the efficiency of N retention

Technical solutions:

Veal calves

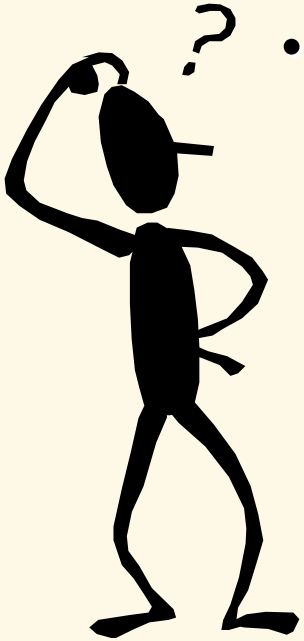
Improve knowledge on true digestibility & efficiency of absorption of dietary essential aminoacids

Fattening young bulls

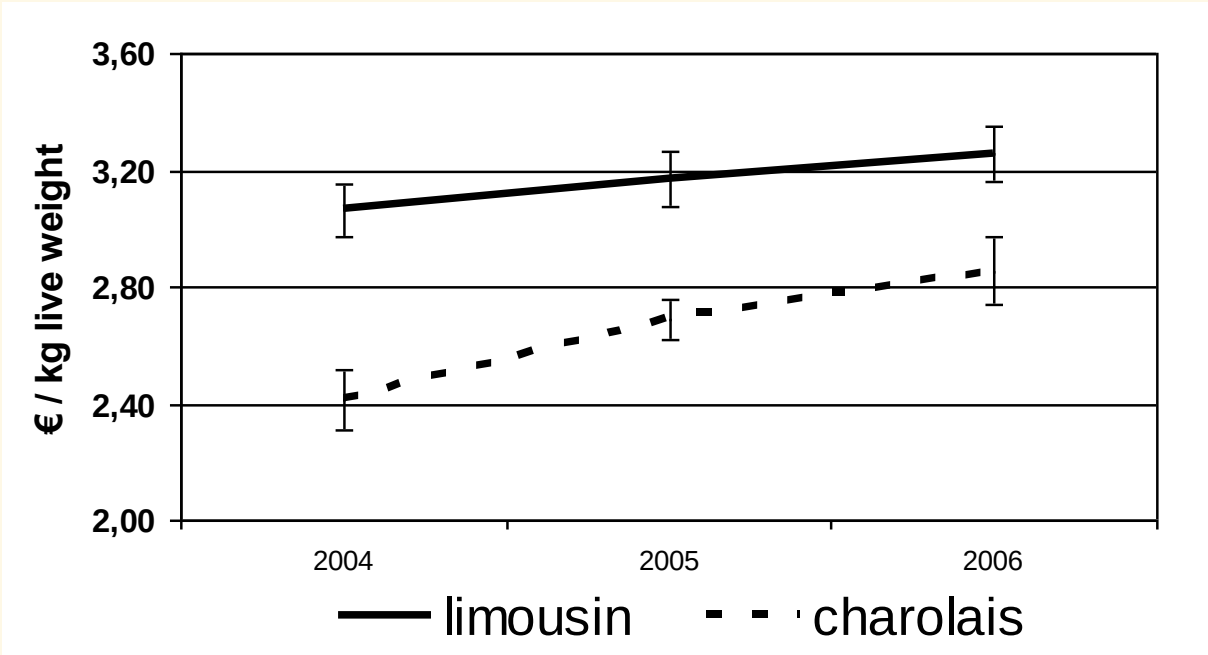
Feeding solutions capable to maximize microbial growth in the rumen

The dependence on imported cattle

Problems:



- **Increasing trend of costs of foreign cattle**



- **Additional costs and limitations for cattle transport due to new regulations on animal welfare**

The scientific research

Mission:

To improve the fleshiness traits of the young livestock

Reproduction

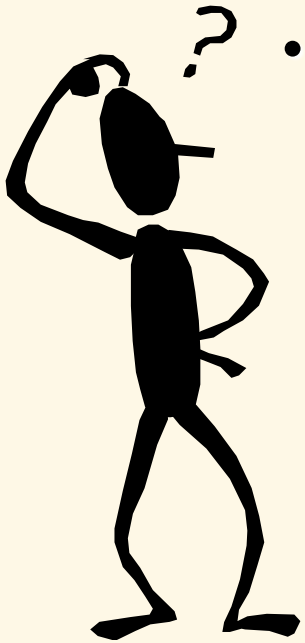
Reduce the fertility problems in dairy cows to allow a wider use of the cross-breeding with beef bulls

Biotechnology

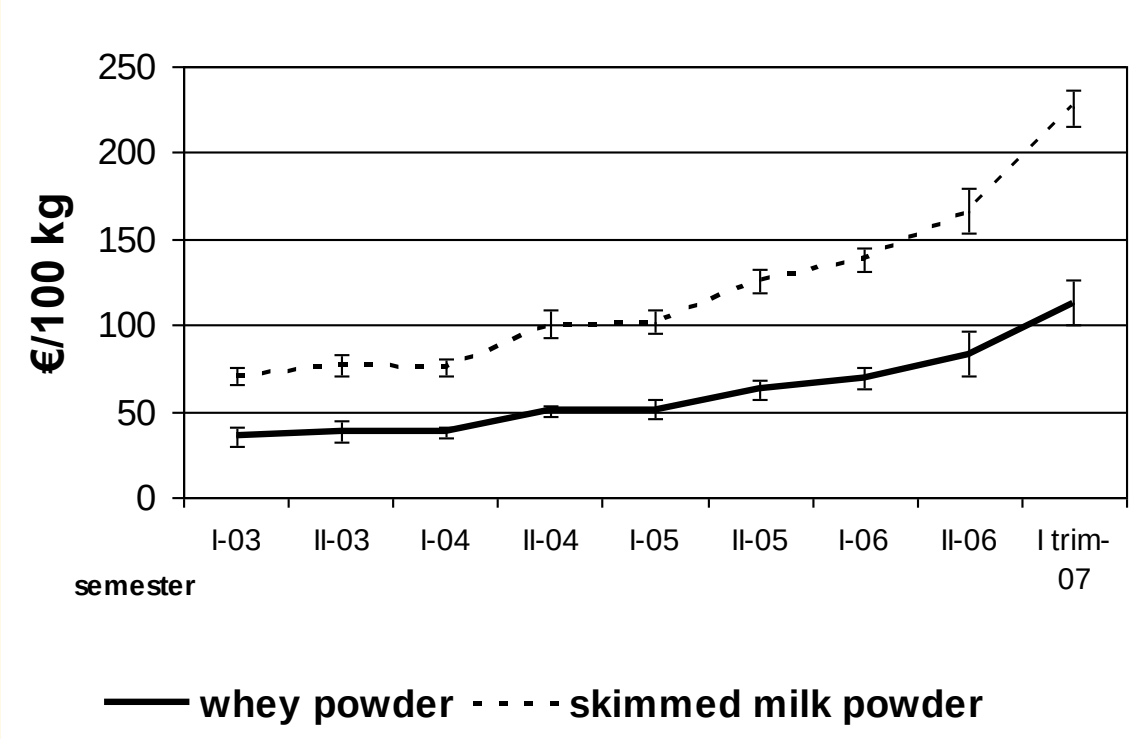
Production and use of male sexed semen of beef bulls in cross-breeding schemes

The need for new feeding strategies

Problem for veal calves:



- **Sharp increase in the cost of main raw materials used for milk replacers formulation**



The scientific research

Mission:

To reduce the amount of milk replacers by feeding large amounts of solids feeds

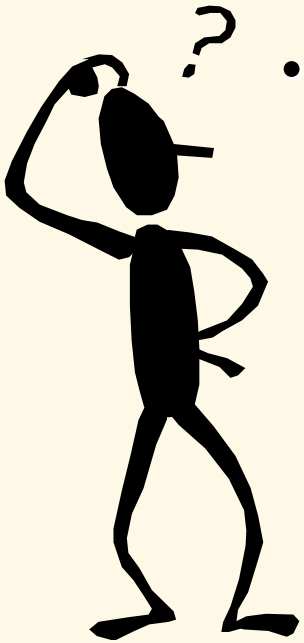
Ideal requirements of a solid feed for veal calves

Not impair the function of the esophageal groove

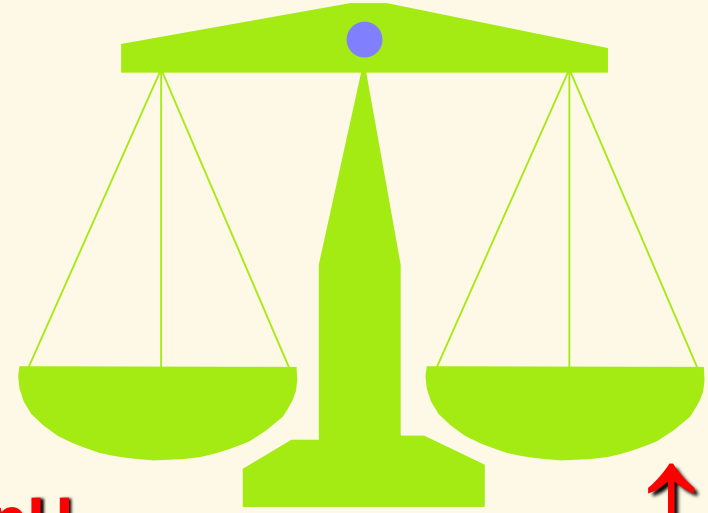
Low iron bioavailability → Suitable meat colour

The need for new feeding strategies

Problem for young bulls and heifers:



- High risk of rumen acidosis due to the low **forage : concentrate** ratio of the diets



↓ **Rumen pH**
High starch & NFC

↑ **Rumen pH**
High NDF

The scientific research

Mission:

To find alternative feeding solution capable to increase the effective fiber of the diet without lowering the starch content

Technical solution:

Inclusion of large amount of coarsely chopped maize silage as main roughage source of the TMR

Use of coarse maize silage as sole roughage source for finishing bulls

(Source: Cozzi et al., 2005)

9 mm Chopping lenght 19 mm

Penn State FP separator		Maize silage		P	SEM
		Short	Long		
> 19 mm	%	2.9	27.7	***	2.8
> 8 mm	%	77.0	57.8	***	4.6
Bottom	%	22.2	14.5	**	5.5

Feed and chemical composition of the experimental diets

		MS-Short+Straw	MS-Long	P	SE
MS-short	kg/d	5.0	--		
MS-long	"	--	10.0		
Starch sources	"	4.2	3.2		
Soybean meal	"	1.2	1.1		
Sugar beet puls	"	1.3	1.0		
Bran	"	0.3	0.4		
Straw	"	0.7	--		
Min-vit	"	0.4	0.4		
Dry matter	%	57.7	50.6	**	2.3
Crude protein	%dm	13.2	13.3	NS	0.7
NDF	%dm	32.2	31.7	NS	2.2
Starch	%dm	33.0	33.0	NS	1.8
F : C ratio	%dm	32: 68	45 : 55		

Growth performance, ruminating behaviour and dressing out of finishing Limousine bulls fed the two experimental diets

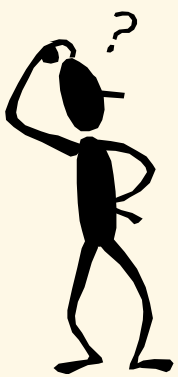
		MS-Short+Straw	MS-Long	P	SE
Live weight:					
- Initial	kg	426	426	NS	7
- Final	kg	622	613	NS	39
Average daily gain	kg/d	1.43	1.35	NS	0.25
Ruminating time:					
- / kg DM	min	35	40	*	3.0
- / kg NDF	min	107	125	*	9.9
Dressing out	%	62.6	62.0	NS	16.3

*P < 0.05.

The animal welfare issue

EU Directives 91/629/CEE e 97/2/EC

No EU regulation in force



Main deficiencies of our rearing facilities

- Housing pens with **fully** slatted floor
- Total **lack** of dedicated alleys & ramps for moving and loading cattle before transport to the abattoir

Conclusions

Italy has still a prominent position in the European scenario of beef cattle production

Solutions are needed to solve impellent issues, first of all the environmental impact of the intensive farms

These solutions must be based on robust scientific knowledge to be accepted by stakeholders & official institutions

Veal and beef producers and the scientific community should work together in a common effort to defend and promote our rearing systems