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FLECKVIEH SIMMENTAL BREEDING IN CROATIA

IVAN JAKOPOVIĆ

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SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

CATTLE PRODUCTION:

- one of the most important agricultural branches in Croatia
- mostly small mixed production units – family farms (approx. 3,5 cows/farm); farm size is growing

SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

Table 1. Breed structure of the active part of the cattle population at the end of 2006

Breed	Breeders		Cows	
	Number	%	Number	%
Simmental	22.311	84,06	133.816	72,28
Hostein	2.424	9,13	42.401	22,90
Brown	1.650	6,22	7.442	4,02
Other	158	0,59	1.468	0,80
Total	26.543	100,00	185.127	100,00

SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

NUMBER OF CATTLE

- Decrease in the number during a long period; >100.000 cows and pregnant heifers lost during the war in 1990s
- Declining trend was still present afterwards (less intensity) until 2000s; today it is stopped, there is a slight increase in the number of animals

SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

Table 2. Trends in the number of cattle

Year	Number of cattle	Number of cows
2002	417.113	251.059
2003	444.320	255.506
2004	465.935	231.009
2005	471.025	241.314
2006	485.268	242.261



SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

- Milk production:

Table 3. Trends in milk production

Year	Number of milking cows	Milk production		Milk delivery (.000 lit)
		Total (.000 lit.)	Per cow (lit)	
2002	257.019	925.436	3.705	498.777
2003	237.472	979.176	4.137	525.028
2004	238.050	1.011.469	4.249	532.841
2005	239.430	1.073.848	4.485	605.721
2006	234.548	1.063.675	4.535	631.619



SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

Trend of growth:

- better management
- system of state subsidies for production

SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

BEEF MEAT:

- EARLIER – production sufficient for own needs and export

TODAY – decline of production, export negligent; smaller number of calves for fattening

CHANGES IN THE PAST FEW YEARS – growing number of slaughtered animals; domestic and imported calves for fattening

SITUATION AND CURRENT TRENDS IN CATTLE PRODUCTION

Table 4. Trends in the number of slaughtered animals

Animal category	Years				
	2002	2003	2004	2005	2006
Bulls and calves	115.063	111.239	125.088	113.050	165.018
Cows	11.417	10.107	12.088	12.584	16.516
Other cattle	193	262	265	235	247
Total	126.673	121.608	138.088	125.869	181.781

Final weight at the slaughtering is growing

PRODUCTION SYSTEMS OF SIMMENTAL BREED IN CROATIA

Simmental breed:

- most used
- Dual purpose: milk and meat

PRODUCTION SYSTEMS OF SIMMENTAL BREED IN CROATIA

Milk production:

- Small family farms:
 - primarily milk production
 - calves: partly fattened at the farm
partly sold for fattening or slaughtering

PRODUCTION SYSTEMS OF USING SIMMENTAL BREED

Milk production:

- Large number of farmers: some have low level of production
- Restructuring of the milk sector:

Operational program of the development of cattle production:

- new farms with 20-100 cows
- reconstruction existing farms
- establish cow-calf system

PRODUCTION SYSTEMS OF USING SIMMENTAL BREED

Beef production

- Small family farms as part of milk production: calves from farms
- Specialised farms for fattening: calves from milk farms or import
- Suckle cows: farms for production of calves for fattening
- Cow-calf system: keeping animals on pastures
- Changes in fattening system – higher final weights: more meat from same number of calves

HISTORY OF SIMMENTAL BREED IN CROATIA

First introduction of Simmental in Croatia at 2nd part of 19th century; owners of large farms, for crossing with domestic breeds

1898.-1905. Croatian government researches most suitable breeds

1903., 1907., 1908. imports from Germany (Baden) Austria (Salzburg) and Switzerland

Attention was given to breeding of bulls for crossing or pure blood breeding

Simmental breed soon becomes dominant

Ongoing link with other populations

Since 1948 (a.i. started) there is a continuing breeding connection with other populations – import bulls for a.i.

HISTORY OF SIMMENTAL BREED IN CROATIA

- Genome structure of the Simmental breed in 1971 (Šebalj):
 - 45,02 % Swiss blood
 - 19,98 % German blood
 - 12,25 % Austrian blood
 - 22,75 other populations and non-defined crossbreeds
- Since 1973 there is a new breeding programme; this genome is different today

BREEDING WORK - HISTORY

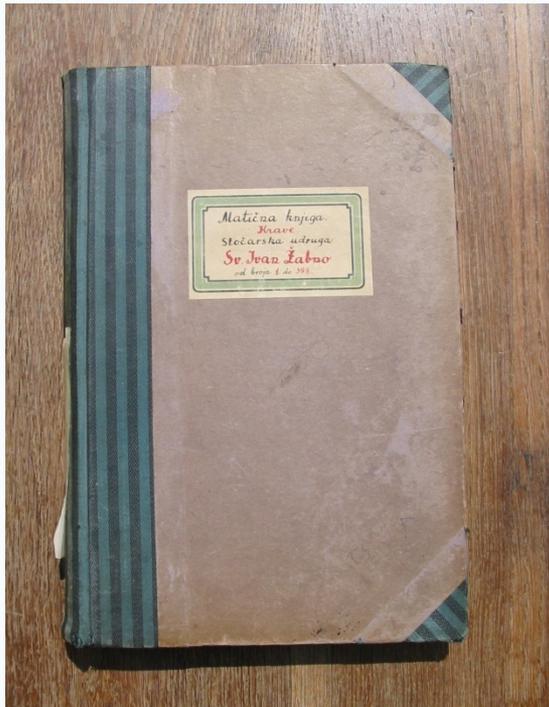
- Introduction of Simmental breed– start of breeding work in Croatia
- Breeding organisations: basic goal is to organise use of bulls and expansion of this breed
- 1904-1911 12 organisations established
- 1912 established Association of cattle breeding organisations, started working in **1913** – start of organised breeding work in Croatia

BREEDING WORK - HISTORY



BREEDING WORK - HISTORY

- Breeding organisations had herd books from the beginning.
- First herd book from 1908 in Sv. Ivan Žabno



BREEDING WORK - HISTORY

1930 Milk control

1969 Electronic data processing

1996 Apart from milk fat, proteins are also analysed

2003 Milk ingredients are tested in Central laboratory for milk control

- fat, proteins, somatic cells and urea

BREEDING WORK - HISTORY

Central laboratory for milk control



BREEDING WORK - HISTORY

Artificial insemination

1939 research on introduction of artificial insemination

1948 implementation of artificial insemination on population

BREEDING WORK - HISTORY

1957 Association of cattle breeding organisations joined Cooperative Livestock Alliance in order to:

Join breeding work on family and state farms

1960 Croatian Livestock Selection Centre: today Croatian Livestock Centre – inheritors

Today: Breeding work will be implemented by breeders:

- legal basis established
- breeding organisations partly established



BREEDING WORK –IMPLEMENTATION OF GENETIC IMPROVEMENT OF SIMMENTAL BREED

Since 1973 genetic improvement is mostly achieved via implementation of the breeding programme

It is implemented by:

- breeders
- Croatian Livestock Centre
- breeding organisations
- centres for artificial insemination
- testing stations

BREEDING WORK –IMPLEMENTATION OF GENETIC IMPROVEMENT OF SIMMENTAL BREED

Central place in programme implementation has production of bulls via selection of parents:

- bull mothers**
- bull fathers.**

After ascertaining heritage (blood type or DNA analysis), selected calves then go to performance test lasting 120-365 days.

At the end of test the purpose of each bull is decided on the basis of test results (daily growth), exterior and data about breeding values of mother and father as well as reproductive traits.

Best (20-30 %) move to a.i.; others are moved to natural breeding or culled.

Young bulls in a.i. pass test insemination and wait for results of progeny test and calculation of breeding values for:

- Calving difficulty**
- Type**
- Progeny test of meat traits**
- Progeny test of milk traits**

Calculation of breeding values – BLUP Animal model

BREEDING WORK –IMPLEMENTATION OF GENETIC IMPROVEMENT OF SIMMENTAL BREED

1991.- new version of breeding programme:

- basic principles of genetic improvement still same; taken into account changes in population and production, and new scientific knowledge

2007- proposal of new breeding programme;

- partly change in implementation; central role of breeders
- change of breeding weight of some traits

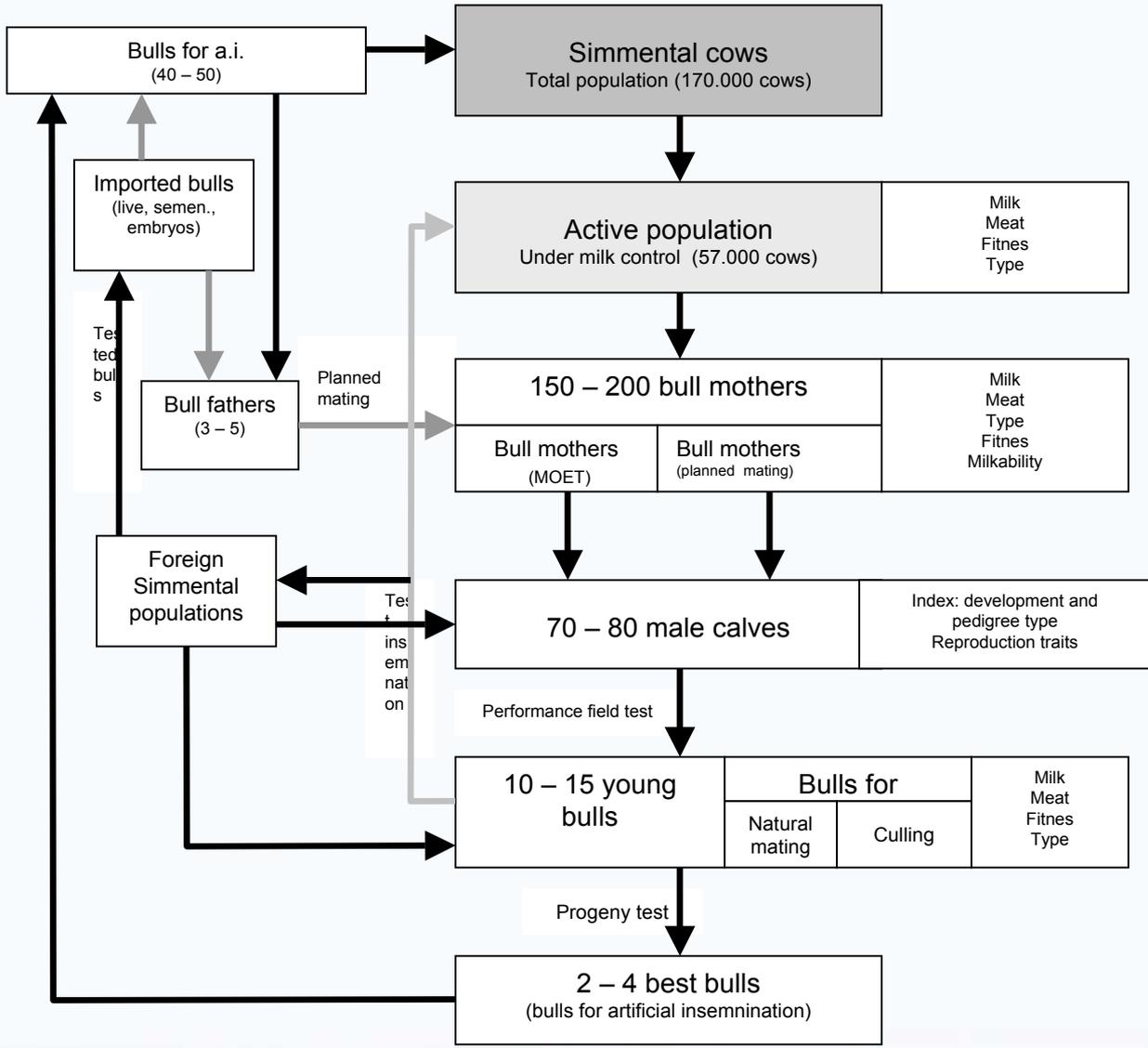
BREEDING WORK –IMPLEMENTATION OF GENETIC IMPROVEMENT OF SIMMENTAL BREED

Table 5. Changes of breeding importance of specific traits in breeding goal

Trait	Breeding programme		
	1973	1991	2007
Milk	55	45	40
Meat	45	55	30
Fitness	-	-	30



Scheme 1. Overview of the proposal of the breeding programme for Simmental breed



BREEDING WORK –IMPLEMENTATION OF GENETIC IMPROVEMENT OF SIMMENTAL BREED

Breeding programme sets new generations of bulls will come from:

- Domestic breed
- Other populations:
 - male calves moving to performance test
 - bulls in test
 - tested bulls

Greater emphasis is placed on breeding cooperation with other Simmental populations.

BREEDING WORK –RESULTS OF THE IMPLEMENTATION OF THE BREEDING PROGRAMME

Breeding programme has been implemented for almost 35 years

Every year:

- 350-400 bull mothers inseminated with semen of 5- 6 best bulls
- approx. 70 male calves for performance test

Until 2006 performance test was done in testing station in Varazdin; since then in field conditions (field test)

BREEDING WORK –RESULTS OF THE IMPLEMENTATION OF THE BREEDING PROGRAMME

Table 6. Results of performance test in Performance test station Varazdin

Indicators Value	Indicators Value
Total number of tested animals (1974-2005)	1.744
Total number of tested animals (1974-2005)	508
Average daily gain during test (120-365 days) in grams	1609,65
Average wither height at the end of the test (cm)	129,74
Average chest girth at the end of the test (cm)	197,32

BREEDING WORK –RESULTS OF THE IMPLEMENTATION OF THE BREEDING PROGRAMME

Progeny test of fattening traits and meat quality is made in test station, and since 2007 also on the basis of EUROP carcass data for:

- class
- net growth
- carcass percentage

Results:

- Performance test: daily growth 1.609 gr.
- Progeny test: daily growth 1.357 gr., carcass percentage 58,23 %, muscle percentage 62,37 %

BREEDING WORK –RESULTS OF THE IMPLEMENTATION OF THE BREEDING PROGRAMME

Milk traits

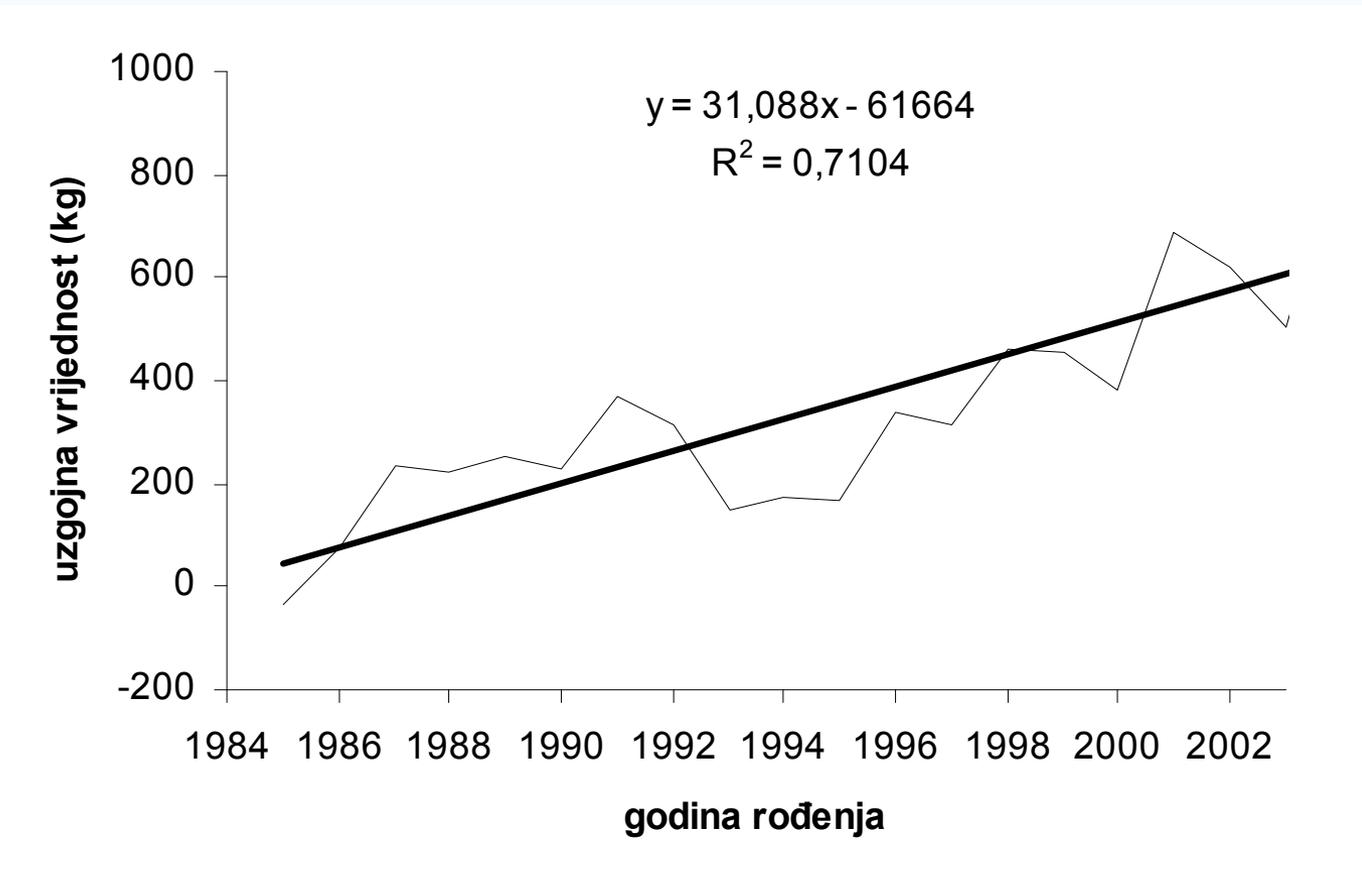
AT and B method

Lactation production in 2006

4.456-4,07-181-3,35-149

Genetic improvement for milk traits (lactation production)

Genetic improvement of milk traits (lactation)



ARTIFICIAL INSEMINATION

From 1948 on more than 75 % of population Simmental bulls are in 4 centres for artificial insemination

Table 7. Structure of live Simmental bulls for artificial insemination (2007)

Bulls from breeding programme - live		Bulls from import - live		Total no. of live bulls		
In test	Tested	In test	Tested	In test	Tested	Total
17	15	20	12	37	27	64

CONCLUSION

1. Simmental breed is in Croatia for over 100 years
2. Croatian livestock production is mostly based on production traits of Simmental breed which will continue in future
3. There is an ongoing reform of cattle production; there are large production units - farms
4. Ongoing establishment of new organisation of breeding work with formation of breeding organisations with breeders as primary implementors of the breeding work
5. Active breeding cooperation in genetic development of Simmental populations of individual countries will contribute to better genetic improvement of the breed as a whole