THE POSSIBILITY OF PRODUCTION AND PLACEMENT OF DONKEY’S MILK IN CROATIA

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3 Zootechnical department; Agricultural Faculty, Osijek, Croatia
GENERAL ABOUT CROATIA

- in Southeast Europe
  - land area about 56 594 km²
- three geographical agro-ecological regions:
  - Mediterranean (coastal) region / hot - dry summers, mild rainy winters / suitably for donkey breeding
  - Mountainous region / middle hot summers, cold winters, good distribution of precipitation / suitably for grassland and pastures
  - Pannonian region / good distribution of precipitation during the year / cereal areas
DONKEY IN CROATIA

- widely used as work animals in some regions of Europe (mainly in the Mediterranean area), Africa, Asia, North America, South America and Australia

- in Croatia, particularly in its coastal area, donkeys have lived for centuries
  - working animals, very good adapted on dry and hot Mediterranean agro-eco zone
  - milk & meat production in past time
Donkeys breeding in recent decades has suffered significant changes. In the middle of the second half of the 20th century donkeys lost their primary functions, followed by a significant decline in the size of their population.

**Graph 1. Number of donkeys in Herd Book in Croatia during last decade (CAA, 2003-2015)**
during a period of adaptation and natural selection, the total populations were profiled in three donkey breeds:

- Littoral Dinaric donkey
- Northern Adriatic donkey
- Istrian donkey

Graph 2. Wither height of donkeys breeds in Croatia (cm)
DONKEY IN CROATIA - TODAY

- working animals – very rarely
- hobby animals – moderate often
- used for tourism - moderate often

RESULTS: population are in status ENDANGERED to CRITICAL ENDANGERED

- Option for their sustainability of population
- A) program for protection of this breeds: state subsidies
- B) find more models for their economic reaffirmation:
  - Milk; meat
  - Agro tourism, folklores manifestation, …
  - Landscape management, …
  - …
DONKEY - MILK - experience and knowledge

- some traditional experience exist

- **example** - donkey’s milk is traditional used in treatment of respiratory diseases
  - whooping cough - a contagious bacterial disease – often affecting children, characterized by convulsive coughs

- traditional experience and demand for donkeys milk motivate breeders for milk production
  - they try buy milk as functional food

- **PROBLEM:**
  - we haven’t exact standards for milk production (milking, milk storage, …)
  - we haven’t information about milking potential of our breeds, impact of feeding, housing and management
AIM OF STUDY

A) determine the potential for milk production in two dominant breed
   - Littoral-Dinaric donkey
   - Istrian donkey

B) proposed exact standards and ways for milk processing and marketing
the study included 30 female
four donkey farms (two in Istria, two in Dalmatia)
by each jennies two control milking was conducted
milking in the morning period (at 9.00 a.m.), manually
  3 hours prior to milking and immediately after milking, foals were physically separated from their mother, but left within the visual contact
after milking, the amount of milk was measured and the samples collected for further analysis were stored at 4 ºC until the chemical analysis
shares ( % ) of dry matter, milk fat, and milk protein were determined by the method of infrared spectrometry by Milkoscan FT120 (HRN ISO 9622:2001)
the results were processed using of the SAS statistical package
RESULTS

- Istrian donkeys have a higher milk yield compared to Littoral-Dinaric donkey – 825 vs. 492 mL/milking

Graph 3. Level of milk production Istrian and Littoral Dinaric donkeys (mL/milking)
RESULTS

- Milk of Istrian donkey had lower content of milk fat than milk from Littoral-Dinaric donkey (0.42 vs. 0.54%), milk protein (1.38 vs. 1.64%) and lactose (5.73 vs. 5.92%).

Graph 4. Chemical composition of milk of Istrian and Littoral Dinaric donkeys (%)
What we can do with fresh milked milk?

- Direct selling FRESH REFRIGERATED MILK (+4°C; using period / till 3 days)
- Direct selling FROZEN MILK (-18°C; using period / till 12 months)
- Processing of milk KUMIS (using period / till 3 weeks)
- Processing of milk YOGURT (using period / till 2 weeks)
- Processing of milk POWDERED MILK (using period depending on drying process)
- Processing of milk COSMETIC PRODUCTS (using period / dependent on product)
  - Soaps, lotions, shampoos, creams, ...
- Processing of milk FOOD PRODUCTS (using period / dependent on products)
  - Chocolate, liqueurs, cheeses, ...

Fresh refrigerated milk ( + 4°C)
PLACEMENT OF DONKEY’S MILK

- What we can do with fresh milked milk?

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- Processing of milk
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  - FRESHLY MILKED MILK
    - KUMIS (using period / till 3 weeks)
  - POWDERED MILK (using period / dependent on drying process)
  - FOOD PRODUCTS (using period / dependent on products)
    - chocolate, liqueurs, cheeses, ... (using period / dependent on product)
    - soaps, lotions, shampoos, creams, ... (using period / dependent on products)

31 AUGUST - 4 SEPTEMBER 2015
WARSAW, POLAND
PLACEMENT OF DONKEY’S MILK

- What we can doing with fresh milked milk?

FRESHLY MILKED MILK

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Primary processing

Fresh refrigerated milk (+ 4°C)

COSMETIC PRODUCTS

Fresh refrigerated milk (+ 4°C)

FOOD PRODUCTS

chocolate, liqueurs, cheeses, ...
soaps, lotions, shampoos, creams, ...

PROCESSING OF MILK

KUMIS (using period / till 3 weeks)

POWDERED MILK (using period dependending on drying process)

YOGURT (using period / till 2 weeks)
What we can do with fresh milked milk?

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**Processing of milk**

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PLACEMENT OF DONKEY’S MILK

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FOOD PRODUCTS
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**COSMETIC PRODUCTS**

- Fresh refrigerated milk (+ 4°C)
- (using period / dependent on product)
- Soaps, lotions, shampoos, creams, ...
THE POSSIBILITY OF PRODUCTION

- 1,100 female donkeys are in reproduction (in 2014)
- 15 to 20 milking farms (5 to 100 donkeys)
- farmers are interested
- consumer's are interested

WEAKNESS

- management of production (knowledge, ...)
- marketing and selling of milk
- diversification of products
THE POSSIBILITY OF PLACEMENT

FRESHLY MILKED MILK

Primary processing

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Processing of milk COSMETIC PRODUCTS
(using period / dependent on product)
WHAT WE CAN DOING

• education of farmers
• education of consumers
• connecting of stakeholders in associations (breeding, production)
• research
• marketing (writing and electronic media)
• …
Ivanković Ante, Potočnik Klemen, Ramljak Jelena
Baban Mirjana, Antunac Neven

Mlijeko kobila ili magarica, poraža je tajnost. Premda su složeni sastavni narodi ljudi tisućama godina konzumirali ovu namirnicu, na području Europe ne spominje se često. Stoga je malo poznato o vrijednosti kobile ili magarićne mlijeka, posebice u širokoj javnosti. Uzrokovanje na
njegova svojstva, način proizvodnje, prerade i plasmana biti će poticaj
svima koji su u osećenom doticaju s mlijekom ovih vrsta, na kritičko
promišljanje. Brojni proizvodi koji sadrže kobile ili magarićne mlijeko
obogatiti će ukupnu ponudu, posebice ruralnih područja. Autentične
pasirne konja i magaraca kroz ovaj vid proizvodnje čuvaju se od
zaborava, istodobno oplemenjujući naš krajolik i svakodnevnicu.
CONCLUSION

• favorable milk production from these two breeds justifies the establishment of this kind milk production if continued placing is provided.

• the modest tradition of donkey milk consumption in Croatia opens the possibility for its production and market development.

• most consumers prefer consuming fresh milk as a functional food in the rehabilitation of some health disorders.

• a small part of the consumers have knowledge about other options of donkey milk consumption, like food products with added value (koumiss, milk powder) or cosmetics.

• it is possible to increase production and consumption of donkey milk in Croatia with good organization of production networks (from producers to consumers.)
Thank you for your attention!