HERD project:

STUDY OF THE MICROBIOLOGICAL FLORA OF MILK AND DAIRY PRODUCTS IN KOSOVO

The microbial flora (quality) of (i) milk and (ii) dairy products in Kosovo: With emphasis on the dairy lactic acid bacteria and the two pathogens *Listeria monocytogenes* and *Staphylococcus aureus*
Institutions and People Involved

University of Pristina:

• Ibrahim Mehmeti, Post. Doc.
• Skender Muji, Professor
• Hysen Bytyqi, Professor
• 2 Master student (right now)
  – Selami Salihu (Master)
  – Ibadete Krasniqi (Master)
  – Imer Haziri (PhD student)

3 Bachelor student (Diploma for Bachelor)

Norwegian University of Life Sciences:

Ingolf F. Nes, Professor
Dzung Bao Diep, Professor
Technical Support
EDUCATION
Master student

- Ibadete Krasniqi (UP- Pristina Kosovo)

- Selami Salihu (Agriculture University - Tirana Albania)
Bachelor student

1. Remzi Jetullahu

1. Valdet Thaqi

2. Idriz Lallosi

...
1. Imer Haziri (PhD student)

1. Ibadete Krasniqi Master student
Laboratory Manuel

• Microbiology and food microbiology

  – Agriculture Faculty and Veterinary used for students, farmers and company
RESEARCH
RESULTS

I. Isolation and characterization of bacteria in milk obtained from producers
Sampling of milk for bacterial analysis

Communities: 10

Farms: 237

Number of samples: 711 (3 tomes from each farm)

    In December-February (237 samples)
    In March- April (237 samples)
    In May-June (237 samples)

Bacterial isolates: 5000
Samples collection

- Podujeva
- Istogu
- Skenderaj
- Istogu
- Rahoveci
- Gjakova
- Theranda
- Sharri
Total Viable Count

28% complyies with the regulation
Analyses

• 5000 different strains are collected
  – 3000 Analyses in Norway
  – 888 are analyzed for biochemical testes:
    – Growth at different pH (6.0 and 9.2)
    – Growth at different NaCl concentration (2% and 6.4%)
    – Growth in two different mediums: MRS and GM17
    – Gas production (homo-fermentative and hetero-fermentative)

– 888 LAB for bacteriocin production
– Multi - Locus – Sequencing -Typing (MLST)?
Classification

Present status of 3000 isolates:

- *Staphylococcus aureus*: 235 isolates
- *Listeria* spp. 112 isolates
- Lactic acid bacteria: 2653
Meeting and visits in farms

• Farms
  – Higher number (more contaminations)
  – Between higher and normal
  – Low number (according to regulation)

  – Milk in company
Higher number of microorganisms

- Bad hygiene;
- No pipeline disinfection;
- Hygiene of the farms;
Between extreme and limits
Good quality

- Good hygiene
- Good ventilation
- Pipeline in good conditions
Bacteriocins activity

• 576 samples are tested;
• 10 % are positive
• Indicators:
  – *Staphilococcus aureus*
  – *Listeria innocua*
  – *Bacillus cereus*
  – *Lactococcus lactis*
  – *Lactobacillus sakei*
Presentations

• Week Science in Kosovo
  – Two oral presentations:
    – Ibrahim Mehmeti and
    – Ibadete Krasniqi
  – Conference in AlbShkenca organized in Macedonia
    – Ibadete Krasniqi oral presentation and Poster
Future work
Samples collection company

- Podujeva
- Istogu
- Skenderaj
- Istogu
- Rahoveci
- Gjakova
- Theranda
- Sharri

Map showing locations in Kosovo with circles around specific areas.
Analysis of dairy products
Workshops

• Two workshops next summer organized with farmers and company;

• Results presentation;

• Gust from Norway and Kosovo
Equipments
Thank you for your attention