Impact of intensification factors on the economics in dairy sheep

Krupová Zuzana¹, Krupa Emil¹, Michaličková Monika²

¹Institute of Animal Science, Prague, Czech Republic
²NAFC-Research Institute for Animal Production Nitra, Slovakia
Background & The aim of the study

Sheep in Central and Eastern Europe in last decades = changes in:
- production focus
- genetic potential
- modernisation
- nutrition & professional skills

... Productivity of breeds and conditions = extensive

What about intensification to:
- increase production?
- improve utilisation of costs?
- reach efficiency?

The aim of the study:
- comprehensive analyse of some intensification factors
- on the economics of Improved Valachian breed

Source of figures: Margetin et al. (2006)
Material & Methods (1)

Improved Valachian breed (base system)
- a multi purpose sheep (milk-meat-wool)
- semi-extensive „Carpathian“ system
- pasture in summer; housed in winter
- 40% of milk is processed to cheese
- ewe lambs mated at age 1.5 year; natural mating

<table>
<thead>
<tr>
<th>Parameter (unit)</th>
<th>Base system</th>
<th>Intensification factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Season of lambing</td>
<td>Seasonal (winter)</td>
<td>Out-off seasonal (autumn)</td>
</tr>
<tr>
<td>Weaning of lambs</td>
<td>Customary (50d)</td>
<td>Early (5d) &amp; sales</td>
</tr>
<tr>
<td>Production level</td>
<td>Population average:</td>
<td>Breeding goal:</td>
</tr>
<tr>
<td>milk yield (kg/ewe/150d milking period; /MP in total)</td>
<td>100 (124)</td>
<td>130 (160)</td>
</tr>
<tr>
<td>litter size (lambs/lambing)</td>
<td>1.21</td>
<td>1.55</td>
</tr>
<tr>
<td>conception rate of ewes (%)</td>
<td>84</td>
<td>95</td>
</tr>
<tr>
<td>live weight of ewe and ram (kg)</td>
<td>50 / 75</td>
<td>60 / 85</td>
</tr>
<tr>
<td>ADG of lambs till weaning (g/d ♀ and ♂)</td>
<td>0.200 / 0.220</td>
<td>0.290 / 0.330</td>
</tr>
</tbody>
</table>
Material & Methods (2)

Economic evaluation:

- **bio-economic model** ECOWEIGHT, Program for Sheep (Wolf et al., 2011)

Production & Economical Data of Categories & Flock

Production & Revenues

Costs & Revenues

Modelling / Simulation of the System

Production & Economical Data of Categories & Flock

- Profit (€ per ewe and year)
- Profitability Ratio (%) = effectiveness of expended cost in the flock

 Inputs: Σ 600

 Outputs: Σ 1200

Approaches:

- Markov chain
- Wood function + RC and LS
- van Slyke function (cheese)
- Growth curve + gender, LS, genotype
- nutrient and feed requirement
- milk and lamb price on quality

http://inited.cz
Results (1)

Impact on the flock production:

1. Out-off seasonal lambing
   - Conception rate of ewes -10 p.p.,
   - Ewes at first lambing 26% → 30%
   - Average milk yield per ewe -17%

2. Early weaning + sale / + rearing of lambs
   - Milk yield per milking period +26%

3. Breeding goal
   - Ewes at first lambing 26% → 22%
   - Average lifetime of ewes 4 → 5 years
   - Lamb production 11 kg → 21 kg/ewe/year
Results (2)

Impact on the economics:

1. Cost
   - Costs per ewe and year without dramatic change (+2% to +8%)
   - Feeding and fixed costs the most important items (35% for both)
   - Costs for other categories +15% (out-off seas.) and +38% (early w.& rearing)
   - Total costs per ewe and year +2% to +10%

2. Revenue
   - Total revenue per ewe and year +2% to +36%
   - Milk and cheese - the most important resources (70% to 90%)
   - Lambs = 30%, when higher reproduction and growth intensity
Results (3)

Impact on the economics:

3. Profit and profitability ratio (PR)

- No subsidies when profit calculation
- Positive profit for "breeding goal": PR = 108%
- "Out-off seasonal" lambing: PR = 81%
  - for the whole flock
  - combination of seasons
  → good premise for PR ≥ 100%
- "Early weaning of lambs" PR 86% and 90%
Conclusions

Intensification factors in semi-extensive system:

- **Positive impact** on the economics and on the costs utilisation
  + existence of reserves in the costs effectiveness in „base system“

- Some aspects for practical application:
  - consider the individual farm conditions (nutrition, biology, technology, labour ...)
  - more intensive breeding process, central nurseries
  - grants/support for investment and time for realisation
  - future: socio-economic and environmental impact
    (i.e. legislative for the emission production)

- ...

Economical and practical points of view
Thank you for attention 😊

Corresponding address: krupova.zuzana@vuzv.cz

Presentation was supported by project MZERO0714 and by the Project NAZV-QJ1310109 of the Czech Republic and APVV-0458-10 and Mlieko No. 26220220098 of the Slovak Republic.