A financial cost-benefit analysis of the “Healthier goats” program to Norwegian dairy goat farmers

Gunvor Elise Nagel-Alne (1,2)
Paul Steinar Valle (1,3)
Liv Sølverød (2)
Leif Jarle Asheim (4)
J.Brian Hardaker (4,5)

(1) Norwegian School of Veterinary Science Department of Production Animal Clinical Science
(2) TINE Extension Services, Goat Health Service, Norway
(3) Molde University College, Norway
(4) Norwegian Agricultural Economics Research Institute
(5) School of Business, Economics and Public Policy, University of New England, Armidale, Australia

EAAP 2011, Stavanger
Norwegian goat production

- 430 goat milk herds, 38 000 dairy goats
- 770 other herds, 30 000 goats (mainly fibre and some meat production)
- In addition an unknown number of small husbandries with “hobby goats” not receiving subsidies from the Government
The "Healthier goats" program

- Program for disease sanitation in Norwegian goat herds
- Initiated by Norwegian Goat Health Service in 2001 (still running)
- Financed by the government – farmers get a lump-sum compensation per sanitized goat
- Voluntary participation; introduced policy instrument from 2012 i.e. reduced milk price to non-sanitized herds
- Status pr. August 2011: 432 herds participate, 346 milk goat herds 86 other herds (mainly Cashmere, Boer, Mohair)
Diseases in the “Healthier goats” program

Paratuberculosis (Johne’s disease)

Caprine Arthritis Encephalitis (CAE)

Caseous lymphadenitis (CLA)
“Healthier goats” program, organisation and regulations

• The project rely on strict organisation and detailed regulations (http://geithelse.tine.no/English)

• Farmers sign a committing contract with the project giving them free access to advising, serum sampling and analyses

• Local veterinarians and husbandry advisors from TINE are contracted by the project
Sanitation method

- Serological screening of goat herds

- **“Snatching” method** (Heavily infected herds):
  - Remove fetus directly from the birth canal (without contact with the mother or the environment).
  - Raise snatched kids in a clean and disease-free stable (using cow colostrum and milk replacer)
  - Slaughter out and rebuild the herd from snatched kids
  - Cleaning/desinfection of buildings

- **Slaughter-out method** (<10% CAE, no CLA or Johne’s):
  - Only infected animals are removed from the herd
  - Continue production as before

- All herds are under disease surveillance for five years after sanitation
Financial cost-benefit analysis (CBA) is about the profitability and financial feasibility of the project to the key participants.

Levels of interest affected by the “Healthier goats” project:

<table>
<thead>
<tr>
<th>Level of interest</th>
<th>Costs</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Consumers/markets</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Processors/industry</td>
<td>None or limited</td>
<td>Some potential</td>
</tr>
<tr>
<td>Goat farmers</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Farmers costs
- Work load to snatch and raise the kids
- Separate feeding of snatched kids
- Investments in farm buildings
- Increased feeding costs due to higher yields

Farmers benefits
- Sanitation results in higher milk yields
- Improved milk quality
- Lower replacement costs
Material (1)

- Questionnaire to 24 goat farmers (answers from 19)
- Herd data from TINE Goat Herd Control Database and TINE Efficiency Control Database
- Studies on milk yield and quality by Hardeng et al 2009a and 2009b (Husdyrforsøksmøte, Norway, 2009)
- Handbook of Farm Planning 2009/2010, NILF
- Expert opinions
Assumptions and inputs:

- Adjustment of production to the milk quota
- Snatching and raising kids etc. requires 28.4 h/goat
- Herd age composition adjustments over five years
- Feed and work are valued at market prices
- Replacement rate lowered to 25.4 % from 32.2 %
- Annual milk yield +21 %(from 627 to 756 kg) (adjusted for control)
- Milk price: NOK 8.29/l (EUR 1.07/l)
- Calculations performed with and without governmental support
Calculation of Net Present Value (NPV)

\[ NPV = \sum_{t=1}^{T} \frac{C_t}{(1+r)^t} - C_0 \]

- \( C_t \) = net cash flow, \( t \) = time of cash flow, \( r \) = rate of interest (4.5 and 6.5%)
- \( T \) = Time period 5, 10 and 20 years
- \( C_0 \) = net investment costs to farmers after deduction of program support
- NPV is calculated using MS Excel
## Results

Financial cost benefit analysis of the Healthier goats program. NPV in NOK 2009

<table>
<thead>
<tr>
<th>Years</th>
<th>With governmental support</th>
<th>Without governmental support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>r = 4.5 %</td>
<td>r = 6.5 %</td>
</tr>
<tr>
<td>5</td>
<td>kr -31 926</td>
<td>kr -48 306</td>
</tr>
<tr>
<td>10</td>
<td>kr 293 320</td>
<td>kr 231 744</td>
</tr>
<tr>
<td>20</td>
<td>kr 763 297</td>
<td>kr 585 009</td>
</tr>
</tbody>
</table>
Discussion

• The health status of Norwegian dairy goats has improved due to the “Healthier goats” project

• Snatching is resource demanding and expensive

• Surveillance in sanitized herds is crucial

• Aim to handle new cases (including re-infections) with slaughtering in a goat disease control program
Conclusions

• "Healthier goats" enables farmers to sanitize and rebuild new herds

• Sanitation by snatching without project support would be less financially feasible

• Welfare of goats is improved

• "Healthier goats" has prepared the ground for a future disease control program in the Norwegian goat population

• The project has likely improved the competitiveness of Norwegian dairy goat farming

• Economic cost-benefit and risks to be addressed in further works
Acknowledgements

• TINE

• Norwegian School of Veterinary Science

• Norwegian Research Council

• “Healthier goats” program

• Participating goat farmers in our study

• Frøydis Hardeng for work on lactation curves and milk quality analysis
Thank you for your attention!