Economic assessment of policy options to reduce antibiotic prescribing in veal calf production in Switzerland

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The “Calf project”

2 years project conducted by Swiss Bovine Health Service in Zurich (CH)

Funded by the Swiss Federal Food Safety and Veterinary Office

Objectives of the project:

- Identification of policy options for AM use reduction (workshop)
- Assessment of income of large animal practices due to AM disposal (data collection through questionnaire survey)
- Partial budgeting at practice level to evaluate options to compensate losses of revenues
Organisation of the veal production in Switzerland
Partial budgeting

What has changed/would change in one year at practice level after the implementation of a national intervention?

- General herd health planning
- New vaccination programmes implemented
- Prescription fees for AM prescription
- Administration for AM (registration in database)
- Management of AM stock at practice
- Phone calls for reminders to farmers
- Team meeting about practice management
- Margin from AM sales
- Consultations for AM prescription

\[
\begin{align*}
\text{Net change in profit (CHF/year)} &= \left( \text{added income} + \text{reduced costs} \right) - \left( \text{added costs} + \text{reduced income} \right)
\end{align*}
\]
Scenarios tested

1. **Benchmarking among veterinary practices**
   - National action organised by the government to set a point of reference for veterinary practices to compare their own AM prescription level or sales to others or the reference point.

2. **Benchmarking among veal calf operations**
   - National action organised by the government to set a point of reference for AM calf operations to compare their own AM use to others or the reference point.

3. **No sales of AM by practices**
   - Veterinarians would not be allowed to sell AM anymore. Pharmacists would assure the delivery of drug (sales after the prescription).

3a. **Non-profit from AM sales by practices**
   - Veterinarians would not be allowed to make profit from the sales of AM.
Impact of the Scenario 1 - vet benchmarking

- General herd health planning
- New vaccination programmes implemented
- Prescription fees for AM prescription
- Administration for AM (registration in database)
- Management of AM stock at practice

Added incomes
- Added costs
- Reduced incomes
- Reduced costs

4h for specific strategy planning with all rural employees of the practice about AMU reduction per year

- Phone calls for reminders to farmers
- Team meeting about practice management
- Margin from AM sales
  Consultations for AM prescription
Impact of the Scenario 1- vet benchmarking

- General herd health planning
- New vaccination programmes implemented
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25% losses of consultations because no AM would be prescribed
Model building

Stochastic approach

- Uncertainties from the consortium
  - lack of data
  - difficulty to assess the real impact of only one intervention
- Variability
  - in the success of scenarios e.g. decrease of AM prescription after the implementation of Sc1
  - between the practices: distribution adapted from the 29 veterinary practices and 84 calf operations

Best vs worst management scheme

- Willingness to change
  - veterinarians and farmers
  - changing habits
  - potential economic impacts in production and animal health
- Capacity to adapt from the practice
  - number of employees
  - other sources of income
  - trust between farmer and veterinarian
Variables – stochasticity

- General herd health planning
- New vaccination programmes implemented
- Prescription fees for AM prescription

Number of calf operations linked to the veterinary practice

- Added incomes
- Reduced costs
- Added costs
- Reduced incomes

- Phone calls for reminders to farmers
- Team meeting about practice management
- Margin from AM sales
- Consultations for AM prescription

- Administration for AM (registration in database)
- Management of AM stock at practice
Variables – best/worst management scheme

- General herd health planning
- New vaccination programmes implemented
- Prescription fees for AM prescription

**Added incomes**
- General herd health planning consultations per year per practice
- 75% (best) or 25% (worst)

**Added costs**
- Phone calls for reminders to farmers
- Team meeting about practice management

**Reduced costs**
- Margin from AM sales
- Consultations for AM prescription

**Reduced incomes**
- Administration for AM (registration in database)
- Management of AM stock at practice
Assumptions for calculation

1. 50% for AM gross margin (median value)

2. Stable health status of the calf operation after AMU reduction

3. Exclusive relationship farmer/veterinarian
   - Changes (losses and gains) linked to the studied practice
   - E.g. vaccination or herd health management consulting
Data collection

Survey among veterinary practices

- Conducted by the Swiss Bovine Health Service (Vetsuisse-Faculty, Zürich)
- Survey conducted in January-February 2018
- 29 answers / 120 practices contacted

Data used for partial budgeting: invoices for veal calf operations over 1 year (2017)

29 practices
84 calf operations (~3 calf operations per practice with different health status)
2'152 invoices
9'119 positions on bills collected
Results

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Best management scheme (CHF/year)</th>
<th>Worst management scheme (CHF/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1</td>
<td>52'215</td>
<td>3'723</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>49’466</td>
<td>1’903</td>
</tr>
<tr>
<td>Scenario 3a</td>
<td>36’615</td>
<td>-7’419</td>
</tr>
<tr>
<td>Scenario 3b</td>
<td>35’293</td>
<td>-8’548</td>
</tr>
</tbody>
</table>

Stochastic approach via @Risk (median of 10’000 iterations)
Discussion

● **Selection of scenarios**
  ○ Based on previous interventions in Europe: Denmark, Finland, the Netherlands, Belgium, Germany, Austria, UK... (workshop)
  ○ Based on scientific literature (Postma et al. 2016, Speksnijder et al. 2015 etc.)
  ○ Swiss national interventions ongoing: benchmarking for calf operations and veterinarians, reduce need of traders

● **Scenario 3a and 3b are the less successful scenarios**
  ○ Loss of 8'500CHF per year, = 700 CHF/month
  ○ Conflict of interest of veterinarians with prescribing and selling AM?
  ○ Option the least liked from veterinarians, identified from previous studies (Postma et al. 2016, Speksnijder et al. 2015)
  ○ Access to AM from remote calf operations: Finland vs. Denmark
Discussion

- Selection of alternative options to compensate loss of income
  - From consortium and literature review
  - Veterinarians as a herd health consultant
  - Education of veterinarians: from universities to continuous education

- Veal calf industry in Switzerland and AMU
  - Survey among veterinarians and AM experts: reduce by 50% the use of AM among veal calves in Switzerland (Carmo et al. 2018, Postma et al. 2016, Bos et al. 2015, Speksnijder et al. 2015, Dorado-Garcia et al. 2015)
Main references


Thanks for your attention

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