Sheep Breeding in the Czech Republic

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ICAR Dairy Sheep and Goats, S2, Jean-Michel Astruc
Friday, 23 May 2014
Agenda/outline

• Organisation of sheep breeding performance recording and estimation of breeding values
• Basic overview and statistics
• Meat performance recording
• Milk recording
• Estimation of breeding values and selection index used in the Czech Republic
• Genetic trends
• Breeding rams classification
• Udder morphology
• Genetic defects
• Scrapie resistance
• Other relevant details
History of sheep breeding in the Czech lands

- 18th century – The age of the golden fleece
  - Ferdinand Geisslern (1751-1824) “The Moravian Bakewell”
- 1971 - CC test
- 1999 - ultrasound measurements
- 2003 – BLUP
- 2011 – Test Day BLUP for milk traits
Organisation of breeding in the Czech Republic

Records, pedigree
EBV

Breeders association

Records
EBV, SI

Individual breed clubs

Breeding strategies methodology
Suggestions

Herdbooks board

Performance and milk recording - associations and commercial organisations

Czech Moravian Breeders’ Corporation, Inc.
Breeding values estimation
Changes in sheep numbers in the Czech Republic since 1921

Number of sheep (in thousands)

220,521 sheep of all categories in 2013
Changes in structure of breeds 1990-2013
# Sheep-breeding companies in the Czech Republic in 2013 (all companies and animals)

<table>
<thead>
<tr>
<th>Number of sheep in one company</th>
<th>Companies</th>
<th>Share of animals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
</tr>
<tr>
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<td>9,710</td>
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<td>3,610</td>
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<td>51–100</td>
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</tr>
<tr>
<td>101–200</td>
<td>247</td>
<td>1.7</td>
</tr>
<tr>
<td>201–300</td>
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<td>0.3</td>
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<td>901–1,000</td>
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<td>0.0</td>
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<tr>
<td>&gt;1,000</td>
<td>9</td>
<td>0.2</td>
</tr>
<tr>
<td>Total</td>
<td>14,229</td>
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The scope of meat performance recording

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<tr>
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<th>2012</th>
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<td>Number of herds</td>
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<td>452</td>
<td>462</td>
<td>465</td>
<td>478</td>
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<tr>
<td>Number of ewes</td>
<td>22,932</td>
<td>23,070</td>
<td>21,722</td>
<td>21,317</td>
<td>23,446</td>
<td>22,632</td>
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<tr>
<td>Average herd size</td>
<td>49</td>
<td>51</td>
<td>47</td>
<td>46</td>
<td>49</td>
<td>45</td>
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</table>

- 34 breeds included in performance recording
- **Only 17 breeds are numerous enough to use in the selection process** (Bergschaf, Tsigai, Charollais, Romney, Merinoland, Lacaune, German Black Face, Oxford Down, Romanov, Bohemian Forest Sheep, Suffolk, Texel, Valachian, East Friesian, Improved Valachian, Zwartbles and Synthetic Dairy Line)
- **Prolificacy**
- **Growth intensity**
- **Carcass quality**
Reproduction and lamb survival

- **In ewes**, fecundity and prolificacy are recorded by the farmer and then the reproduction data is collected by the association database.
- **The number of lambs** born, lambs born alive, lambs reared to an age of 14 days and lambs reared to weighing (70-130 days) are all recorded.
- 20,301 lambings were recorded in 2013.
Growth intensity

- In **multipurpose and meat sheep breeds**, lambs at an age range of **70-130 days are weighed**
- Electronic scales in the presence of an authorised individual
- **Dairy sheep lambs are weighed at weaning**
- 22,332 lambs were weighed within the specified age range in 2013
Ultrasound measurements

- **Muscle depth and backfat thickness**
- Terminal sire breeds (Suffolk, Charollais, Texel, Oxford Down, German Blackface)
- Parts of the Romney population in the Czech Republic
- Measurements take place together with lamb weighing at the age of 70-130 days, allowing a high number of lambs to be scanned
- **Scanners with linear probes are used**
- **Scans are performed between the last lumbar and the first thoracic vertebrae**
Fat

M. longissimus thoracis et lumborum

M. multifidus

Vertebra

Spinal cord
A total of 8,129 lambs were scanned using the ultrasound technique in 2013.
### Dairy sheep milk recording – basic figures and information

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of ewes</th>
<th>Milk production (kg)</th>
<th>Fat (%)</th>
<th>Protein (%)</th>
<th>Lactose (%)</th>
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<tr>
<td>2009</td>
<td>821</td>
<td>263.2</td>
<td>6.04</td>
<td>5.55</td>
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<td>2010</td>
<td>1,057</td>
<td>300.2</td>
<td>6.12</td>
<td>5.62</td>
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<tr>
<td>2011</td>
<td>870</td>
<td>351.1</td>
<td>5.97</td>
<td>5.50</td>
<td>4.84</td>
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<td>2012</td>
<td>988</td>
<td>426.0</td>
<td>5.59</td>
<td>5.36</td>
<td>5.13</td>
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<tr>
<td>2013</td>
<td>1,669 (1,358)¹</td>
<td>218.0</td>
<td>6.58</td>
<td>5.55</td>
<td>4.90</td>
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</table>

1) Number of ewes (number of lactations)

- Since 2013, the length of the milking-only period is **150 days** (before that it was 240 days)
- Since 2013, only the AT method is used
- AT – first test day starts when suckling period ends
- First test day not later than 52 days after suckling period
- Test days are conducted in 30-day intervals
- Milking tests are performed on ewes over a period of usually 4-5 test days
Number of recorded dairy ewes

Year | Number
--- | ---
2005 | 200
2007 | 400
2009 | 800
2011 | 1200
2013 | 1800
Changes in proportion of sheep kept in flocks of different size
Breeding value estimation

- BLUP Animal Model
- Prolificacy (litter size)
- Lamb weights at an age of 100 days
- Eye-muscle depth
- Back-fat layer thickness in 5 breeds
- Milk and milk-fat/protein production

\[ P = G + E \]
Breeding value estimation

- Breeding values are estimated from **May to August in monthly intervals** (for lamb selection)
- **At the end of October**
- **February** (for young rams above the age of 1 year)
- From the point of view of reliability when estimating breeding values, unfavourable conditions arise from the lack of artificial insemination and the limited relationship in the connectedness between flocks
## Effects included in model equations for estimating breeding values of various traits

<table>
<thead>
<tr>
<th>Effect</th>
<th>Prolificacy</th>
<th>Liveweight of lamb</th>
<th>Ultrasound measurements</th>
<th>Milk production</th>
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<td>Contemporary group</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>F</td>
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<td>Control day in flock</td>
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<tr>
<td>Sex</td>
<td>F</td>
<td>F</td>
<td>F</td>
<td></td>
</tr>
<tr>
<td>Reared lambs</td>
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<td>F</td>
<td>F</td>
<td></td>
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<tr>
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<td>F</td>
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<tr>
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<td>F</td>
<td>F</td>
<td></td>
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<tr>
<td>More frequent lambing</td>
<td>F²</td>
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<tr>
<td>Live weight</td>
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<td>Days in milk</td>
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<tr>
<td>Mother permanent environment</td>
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<tr>
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<tr>
<td>Random residual effect</td>
<td>R</td>
<td>R</td>
<td>R</td>
<td>R</td>
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</tbody>
</table>

1 Explanatory notes: F – fixed categorical effect, C – co-variable, R- random effect, RR-random effect with relationship matrix
2 in Romanov and Merinoland breeds
Weight coefficients for individual traits in selection indices for various breeds or groups of breeds

<table>
<thead>
<tr>
<th>Group of breeds</th>
<th>Breeding values of individual traits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Weight individual (kg)</td>
</tr>
<tr>
<td>Suffolk</td>
<td>30</td>
</tr>
<tr>
<td>Texel</td>
<td>30</td>
</tr>
<tr>
<td>Other meat breeds</td>
<td>25</td>
</tr>
<tr>
<td>Merinoland</td>
<td>20</td>
</tr>
<tr>
<td>Other combined</td>
<td>20</td>
</tr>
<tr>
<td>Dairy breeds</td>
<td>2.5</td>
</tr>
</tbody>
</table>

1 Production of milk fat and protein per milking period

- Selection indices (CPH) are computed on the basis of breeding values. Weight coefficients, by which individual breeding values are multiplied, are listed in the table above.
Genetic trend – 100d weight – direct gen. ef. SUFFOLK

BLUP
Phenotypic trend - 100-day weight
Suffolk (in kilograms)
Breeding rams classification

• Breeding values and selection indices are published on the breeders association website and in breeding rams catalogues
• Breeding rams are classified in the majority of breeds from the age of 6 months
• All classified rams have to be genotyped for the PrP gene and scrapie resistance in order to determine that they are not a VRQ allele carrier
• The parentage verification of the rams is verified by a genetic microsatellite test
Breeding rams classification

• Classified rams undergo a linear type assessment on a 1-5 code scale for body size, muscle conformation, chest width, rump width, backline, rump angle, side hock angle, fore and rear legs, foot angles and wool assessment

• Based on the selection index (CPH) and the type assessment, each classified ram is included in the overall breeding class: Elite Record, Elite A, Elite B, I, II. If they are not included they are then eliminated from breeding
Udder morphology - dairy sheep

- 1-5 scale is used
- Detailed points are used, which effectively means it is a 9-point scale
- Only selected herds

- Dairy sheep
- Tests are not routine
- Implemented and tested
Measured traits:
- Udder height
- Udder width
- Length of teat

Assessed traits:
- Teat placement
- Udder attachment
- Splitting of udder
- Udder ultrasonography
- Tested
- Correlation with milk production
- Trait: udder cistern area of cross-section
- Probe positioned at axis of teat
Products

- Consumption 0.3 kg
- The share of animals slaughtered at the slaughterhouse from 2007 until 2013 ranged from 6.8% to 12.8%
- The average slaughter weight of heavy lambs in slaughterhouses was 32.6kg of the live weight
- 144,319 animals are slaughtered per year
- The price per kilogram of live weight is between €1.43 to €2.15 per kilogram, i.e. €4.66 per kilogram of carcass
- Overall there is a positive balance of foreign trade in live animals
Development of breeding work in the Czech Republic

• Currently development is focused on functional traits that are mainly connected with lamb survival
• In dairy sheep attention is paid to the assessment of the morphological and functional characteristics of udders
• We are continuing to develop the highly prolific line of Merinoland breeds based on FecB allele carriers
• In 2013 an insemination station for rams was established, allowing the possibility for a wider application of this method in sheep breeding programs in the Czech Republic
Genetic resources
Genetic resources

- Bohemian Forest Sheep
- Valachian Sheep
<table>
<thead>
<tr>
<th>Data</th>
<th>Wiadomość</th>
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<td>13.04.2014</td>
<td>UPOZORNIENIE NA STAN W POLITYCE</td>
</tr>
<tr>
<td>13.04.2014</td>
<td>UPORZYKOWANIE NA STAN W POLITYCE</td>
</tr>
<tr>
<td>19.03.2014</td>
<td>LEWITAP W NIJERI DORDE NEBEDE</td>
</tr>
</tbody>
</table>

**Produkty**

- Ovčí a kozí mléko
- Ovčí vina ručně připravené

**Zakładanie**

- Ovčí a kozí mléko
- Ovčí vina ručně připravené
Novinky

09.05.2014

MIYSZAN LÓWEC w Koszarziskach vo sobotu 17.5.2014

Zverejnila a vložila do poleho - tak se vám tam lidí.

13.04.2014

Výstava plemen ovci a koz v Brně

Při soudních událostech Techagro, Animal Vetex a Stella regna probíhá výstava plemen ovci a koz.

13.04.2014

UPORNĚNÍ A ŽÁDOST O SPOLUPRACI

DO České republicy se vratila vlci, ochránce přírody jasyjí, ovčára právou další starostí.

13.04.2014

Akumulace a smrće pro plemená hodonity

Akumulací plemenové hodnoty plnění povinných ovčí a koza.

19.03.2014

LEVITAPE V NEJBLÍZÍ DOBĚ MEBUDA

Československá společnost chovatelů a.s. má pro všechny chovateli, kteří soustředí odchovávací...

14.03.2014

Agu vývěby bahnic dále plně vyměřována a vitaminů výživa

Počítá se uvedením už zkušeného, že ano a tuto potřebu na recept jako vývěbu začíná...

Produkty

Ovci a kozi kůže

Hlílové ovčí kože se odměna z mnoha pověřovacího členů, a to i kohoutů, kozí kůže, vše, včetně zvěří...

Ovčí vína ručně sprádaná

Čistá ovčí vína ručně sprádaná na kolovranu, kvalitní pro přechodné, vyrobené z kovů...

Recepty

Stopková kypř...
Plemené hodnoty - Ovce - Jehňata - 2014

Plemené hodnoty Jehňat
ročníků 2013 a 2014
neskouzí k hodnocení na
Jarých NT
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Thank you for your attention!