The use of beef semen in Italian Holstein cows

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1. Italian beef market circumstances
2. The skyline of dairy cattle in Italy
3. Beef breeds used in Italian Holstein cows
4. Factors affect beef semen use
5. Breed effect on Stillbirth, Calving easy and Gestation length
6. Conclusions
In Italy we produce 52% of beef

In Italy we import 48% of beef from abroad

Unicarve - Triveneto Beef Producers Association, 2023
Italian beef cattle breeders take more abroad every year

1 billion euro
to buy young cattle (broutard/ristalli/weaned calves) to fatten

| Slaughtering year 2021 - Vitellone/Scottona (12-24 months of age) |
|-----------------|-----------------|-----------------|
| item            | N. of animals   | Animals in %    |
| Born in Italy   | 479,973         | 33.54           |
| **Imported abroad** | **951,064**    | **66.46**       |
| Total need for Italy market | 1,431,037 | 100 |

Year 2021: The number of young cattle purchased abroad to be fattened in Italy n. 951,064 x approximately 1,200 euros/head
= Euro 1,141,276,800
INCREASE THE WEANED CALVES PRODUCED IN ITALY IN COLLABORATION WITH DAIRY COW BREEDERS!

- Stipulate supply chain commercial agreements
- Use of sexed semen for internal replacement (dairy cow herds)
- Use of semen from beef bulls to obtain beef crossbreeds
- Application of quality and sustainability regulations
- Organize collection of unweaned calves in collection centers
- Organization of weaning centers
- Fattening in protected stables
- Certification of fattened cattle and use of the brand of Italian consortia
OUTLINE

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Italian dairy cattle skyline
31 dairy cattle breeds in milk recordings (closed lactations, source: AIA, 2021)
**ANAFIBJ in numbers**

- 2 Herdbooks (Holstein and Jersey)
- third one is working progress (Brown)
- ≈ 10,000 members
- > 1,100,000 registered cows
- ≈ 800,000 young stock
- 27 employes
- 6 bianconero magazine /year
- 70 breeding values
- 49 runs/year

**ANAFIBJ is one of the 15 members of FEDANA**

<table>
<thead>
<tr>
<th>Records processed (2023)</th>
<th>Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedigree data-records</td>
<td>20,863,419</td>
</tr>
<tr>
<td>Cow lactation records</td>
<td>32,822,933</td>
</tr>
<tr>
<td>Evalutaion Scoring records</td>
<td>11,287,374</td>
</tr>
<tr>
<td>Cows changing herds</td>
<td>2,769,903</td>
</tr>
<tr>
<td>Grade animals</td>
<td>15,851,240</td>
</tr>
<tr>
<td>Managment herd registration</td>
<td>58,379</td>
</tr>
<tr>
<td>Cow’s Insemination records</td>
<td>69,991,452</td>
</tr>
<tr>
<td>Genealogical Certificate (2023)</td>
<td>5,142</td>
</tr>
</tbody>
</table>
## Italian Holstein population around the world

*(WHFF, 2023)*

<table>
<thead>
<tr>
<th>Country</th>
<th>Rank</th>
<th>Total HF cows</th>
<th>Rank</th>
<th>HB-Registered HF cows</th>
<th>Rank</th>
<th>% of di Vacche Holstein iscritte su Totali</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1</td>
<td>7,990,000</td>
<td>5</td>
<td>1,000,000</td>
<td>6</td>
<td>12%</td>
</tr>
<tr>
<td>France</td>
<td>2</td>
<td>2,674,000</td>
<td>2</td>
<td>1,244,946</td>
<td>4</td>
<td>46%</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
<td>2,345,673</td>
<td>1</td>
<td>1,656,116</td>
<td>3</td>
<td>71%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>4</td>
<td>1,600,000</td>
<td>6</td>
<td>650,000</td>
<td>5</td>
<td>41%</td>
</tr>
<tr>
<td><strong>ITALY</strong></td>
<td>5</td>
<td>1,500,000</td>
<td>4</td>
<td>1,148,705</td>
<td>2</td>
<td>77%</td>
</tr>
<tr>
<td>The Netherlands</td>
<td>6</td>
<td>1,152,495</td>
<td>3</td>
<td>1,152,495</td>
<td>1</td>
<td>100%</td>
</tr>
</tbody>
</table>
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Crossbreeding and Beef on Dairy in Italian HF population

In 2030 we expected a 34% (trend is +1.6% per year)

Trend of inseminations with dairy-not-HF and beef breeds

Official data available on the Anafibj Database, 2024
Trend of breed of sire use for BoD in Italian Holstein population
Market average Value of males and females calves of different genotypes, (Trento province, FPA-TN)

<table>
<thead>
<tr>
<th>Breed</th>
<th>Avg. weight</th>
<th>Mean /Euro/kg</th>
<th>Average value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein Friesian (HF)</td>
<td>62.9</td>
<td>€2.07</td>
<td>€144.94</td>
</tr>
<tr>
<td>Brown Swiss (BS)</td>
<td>71.1</td>
<td>€1.75</td>
<td>€124.67</td>
</tr>
<tr>
<td>Simmental (Sim)</td>
<td>72.8</td>
<td>€4.50</td>
<td>€327.79</td>
</tr>
<tr>
<td>Rendena</td>
<td>70.7</td>
<td>€3.64</td>
<td>€257.23</td>
</tr>
<tr>
<td>Alpine Grey (AG)</td>
<td>73.3</td>
<td>€3.65</td>
<td>€267.65</td>
</tr>
<tr>
<td>BB x Brown Swiss</td>
<td>72.9</td>
<td>€6.48</td>
<td>€472.63</td>
</tr>
<tr>
<td>BB x Holstein Friesian</td>
<td>72.7</td>
<td>€5.58</td>
<td>€405.66</td>
</tr>
<tr>
<td>BB x Simmental</td>
<td>73.6</td>
<td>€7.42</td>
<td>€545.70</td>
</tr>
<tr>
<td>BB x Rendena</td>
<td>73.5</td>
<td>€6.70</td>
<td>€492.59</td>
</tr>
<tr>
<td>BB x Alpine Grey</td>
<td>73.7</td>
<td>€6.67</td>
<td>€491.33</td>
</tr>
<tr>
<td>Lim x Brown Swiss</td>
<td>72.7</td>
<td>€5.44</td>
<td>€395.40</td>
</tr>
</tbody>
</table>
OUTLINE

1. Italian beef market circumstances
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AFTER HOW MANY INSEMINATIONS IS USED THE BEEF SEMEN?

REDUCING #INSEMINATION OVER TIME!!!

....except HEIFERS
FREQUENCY OF THE USED OF BEEF SEMEN PER MONTH

NO MONTH/SEASON EFFECT !!!

INSEMINATION MONTH

FREQUENZA

ANNO
2016
2017
2018
2019
2020
2021
2022
2023
FREQUENCY OF THE USED OF BEEF SEMEN PER PRODUCTION LEVEL

BEEF SEMEN IS USED MORE IN HIGH PRODUCTION LEVEL HERDS
% of dairy herd for % of beef semen used

DAIRY HERDS classes for % of use BEEF semen within Holstein in official HB data of ANAFIBJ
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BREED EFFECT analyses for STILLBIRTH, CALVING EASY and GESTION LENGTH
EDITING
Starting observations (calvings) = 949,409

Editing:
- delete sire breeds which recorded a frequency <1%, i.e., Maremmana (30), Podolica (34) and Romagnola (69);
- delete cows for which we did not know date of birth;
- retention of cows born from 1985 onwards;
- retention of calves born between 1995 and 2023
- retention of parity orders from 1 to 10. Parities ≥5 were grouped in one class ('5');
- retention of records with the following age at calving within parity:
  - 18 ≤ cow age ≤ 40 for parity = 1
  - 30 ≤ cow age ≤ 58 for parity = 2
  - 42 ≤ cow age ≤ 76 for parity = 3
  - 54 ≤ age of cow ≤ 94 for parity = 4
  - cow age = any for parity ≥5
- retention of herds for which the number of parity was ≥50 distributed over at least 5 years.

Final observations (calvings) = 807,985.

USING A GLINMIX PROCEDURE (SAS)
Y = birth_year_calf +calf_season +sire_breed +sex +parity +herd +cow (as random)
Stillbirth
(calves death within 48h from calving)

$P<0.001$  
Belgian Blue, Limousine and Marchiana $>>$ Inra95, Holstein, Angus
CALVING EASE

(1 = easy  2 = birth assisted by one person only  3 = cesarean section  4 = difficult part  5 = embryotomy)

Angus, Holstein >> Belgian Blue, Inra95

<table>
<thead>
<tr>
<th>D</th>
<th>A</th>
<th>BC</th>
<th>BC</th>
<th>D</th>
<th>AB</th>
<th>C</th>
<th>C</th>
<th>B</th>
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<tbody>
<tr>
<td><strong>Angus</strong></td>
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<tr>
<td><strong>Blue Belga</strong></td>
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<td><strong>Charolaise</strong></td>
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<td><strong>Chianina</strong></td>
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<td><strong>Frisona</strong></td>
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<td><strong>Inra95</strong></td>
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<tr>
<td><strong>Limousine</strong></td>
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<td><strong>Marchigiana</strong></td>
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<td><strong>Piemontese</strong></td>
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</tbody>
</table>

P<0.001
Gestation length (d)

P<0.001

Inra95 >> Holstein (+5d)
Parity effect on Calving easy for different breed of Sire

<table>
<thead>
<tr>
<th>Sire breed</th>
<th>Percentuale</th>
<th>Easy</th>
<th>Difficult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angus</td>
<td>78.5</td>
<td>68.9</td>
<td>15.9</td>
</tr>
<tr>
<td>Blue Belga</td>
<td>84.1</td>
<td>71.3</td>
<td>12.8</td>
</tr>
<tr>
<td>Inra95</td>
<td>71.4</td>
<td>71.4</td>
<td>10.0</td>
</tr>
<tr>
<td>Limousine</td>
<td>75.7</td>
<td>72.4</td>
<td>12.3</td>
</tr>
<tr>
<td>Marchigiana</td>
<td>72.9</td>
<td>65.2</td>
<td>11.7</td>
</tr>
<tr>
<td>Piemontese</td>
<td>72.3</td>
<td>65.6</td>
<td>10.0</td>
</tr>
<tr>
<td>Frisona</td>
<td>74.7</td>
<td>74.7</td>
<td>9.7</td>
</tr>
</tbody>
</table>

Multiparous cows showed a higher calving easy then primiparous, in avg. around -4%
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Conclusions

BoD is a common practice in Italy in Holstein populations and its interest and use are growing.

Farm profit can benefit from combining the use of sexed semen on the best heifers and cows and beef semen on cows exceeding the replacement needs.

The sire beef breed has an impact on the calving ease of the dam and stillbirth, and this has to be taken into account when BoD is used.

Anafibj developed a tool for the dairy farmers

(ICAR Session 1a – Ferrari et al., 23 May 2024 - 8:54 a.m.)
Thank you for your attention

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