



**ICAR & INTERBULL
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SLOVENIA**



The use of beef semen in Italian Holstein cows

Martino Cassandro

General Manager, ANAFIBJ
Technical Head, FedANA
Full professor, University of PADOVA



Special Thanks: to Maurizio Marusi, Raffaella Finocchiaro, Chiara Franzoni, Mariasole Caccin, Mauro Penasa e Ferdinando Galluzzo, Gloria Manighetti



OUTLINE

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 lenght
6. Conclusions

**In Italy we
produce
52% of beef**



**In Italy we import
48% of beef from
abroad**



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
<u>Imported abroad</u>	<u>951.064</u>	<u>66,46</u>
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*



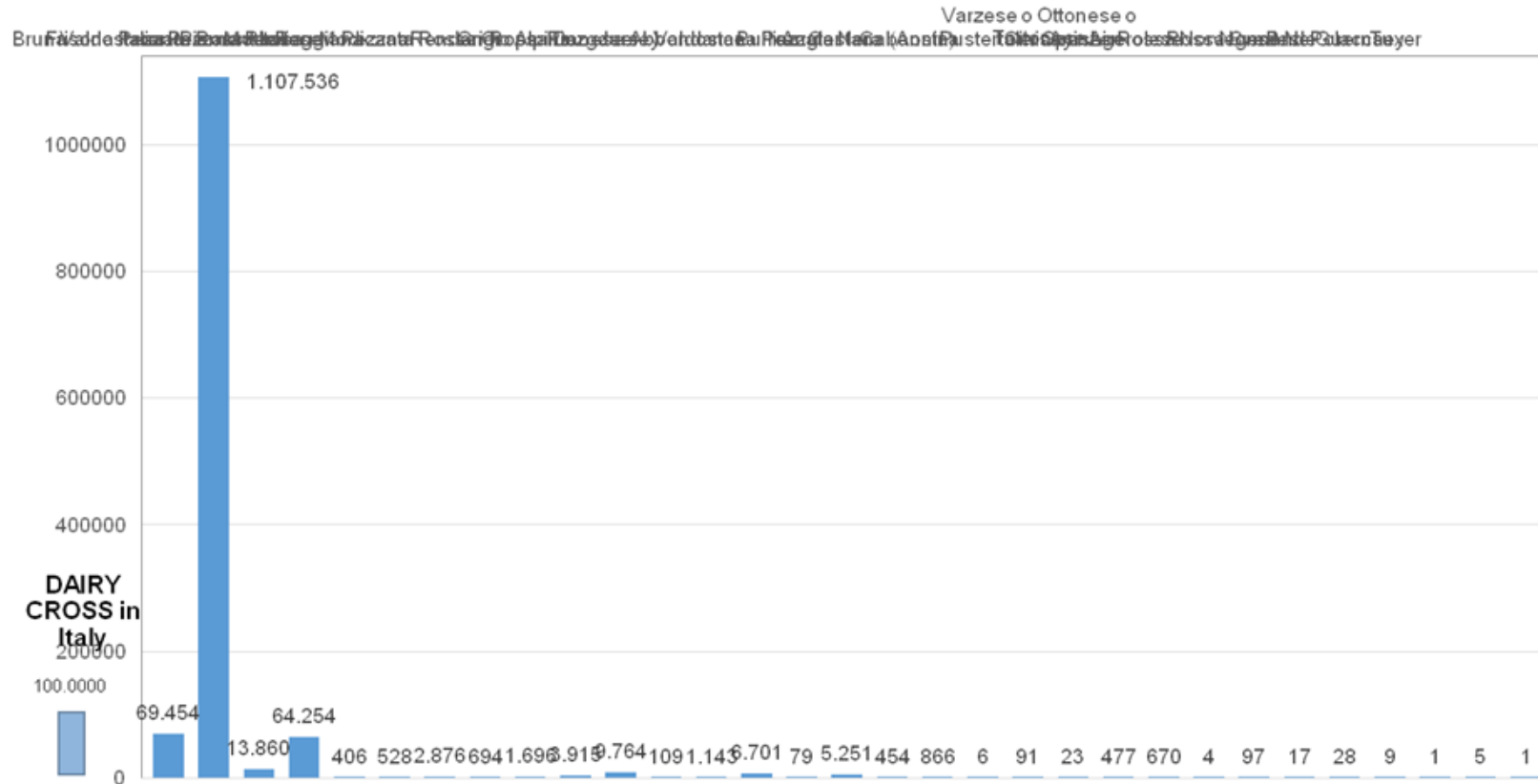
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Italian dairy cattle skyline

31 dairy cattle breeds in milk recordings
(closed lactations, source: AIA, 2021)



your COW
our FUTURE



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/yea



ANAFIBJ is one
of the 15
members
of FEDANA



Records processed (2023)	Numbers
Pedigree data-records	20,863,419
Cow lactation records	32,822,933
Evalutaiotn Scoring records	11,287,374
Cows changing herds	2,769,903
Grade animals	15,851,240
Managment herd registration	58,379
Cow's Insemination records	69,991,452
Genealogical Certificate (2023)	5,142



Italian Holstein population around the world

(WHFF, 2023)

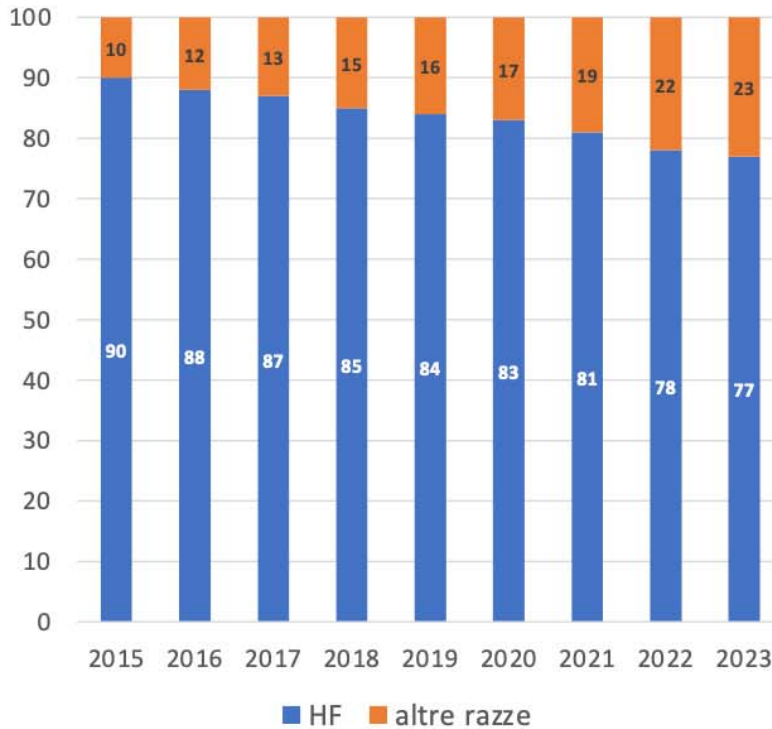
Country	Rank	Total HF cows	Rank	HB-Registered HF cows	Rank	% of di Vacche Holstein iscritte su Totali
United States	1	7.990.000	5	1.000.000	6	12%
France	2	2.674.000	2	1.244.946	4	46%
Germany	3	2.345.673	1	1.656.116	3	71%
United Kingdom	4	1.600.000	6	650.000	5	41%
ITALY	5	1.500.000	4	1.148.705	2	77%
The Netherlands	6	1.152.495	3	1.152.495	1	100%



OUTLINE

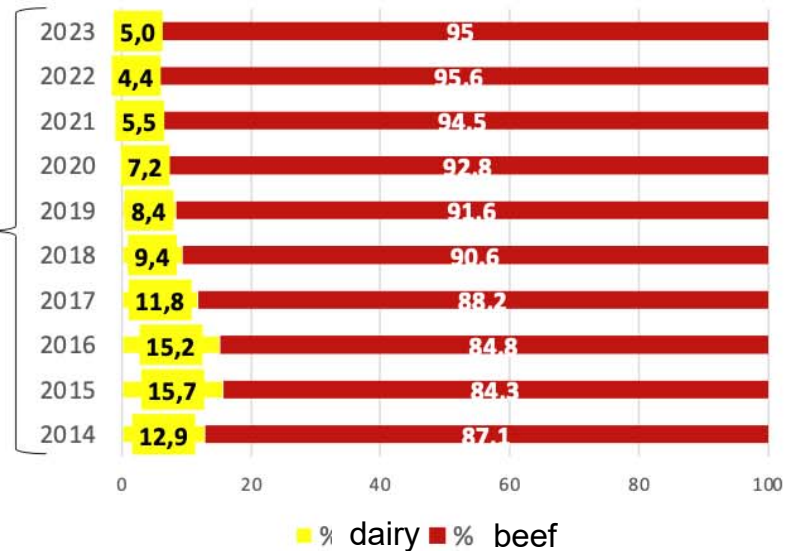
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Crossbreeding and Beef on Dairy in Italian HF population



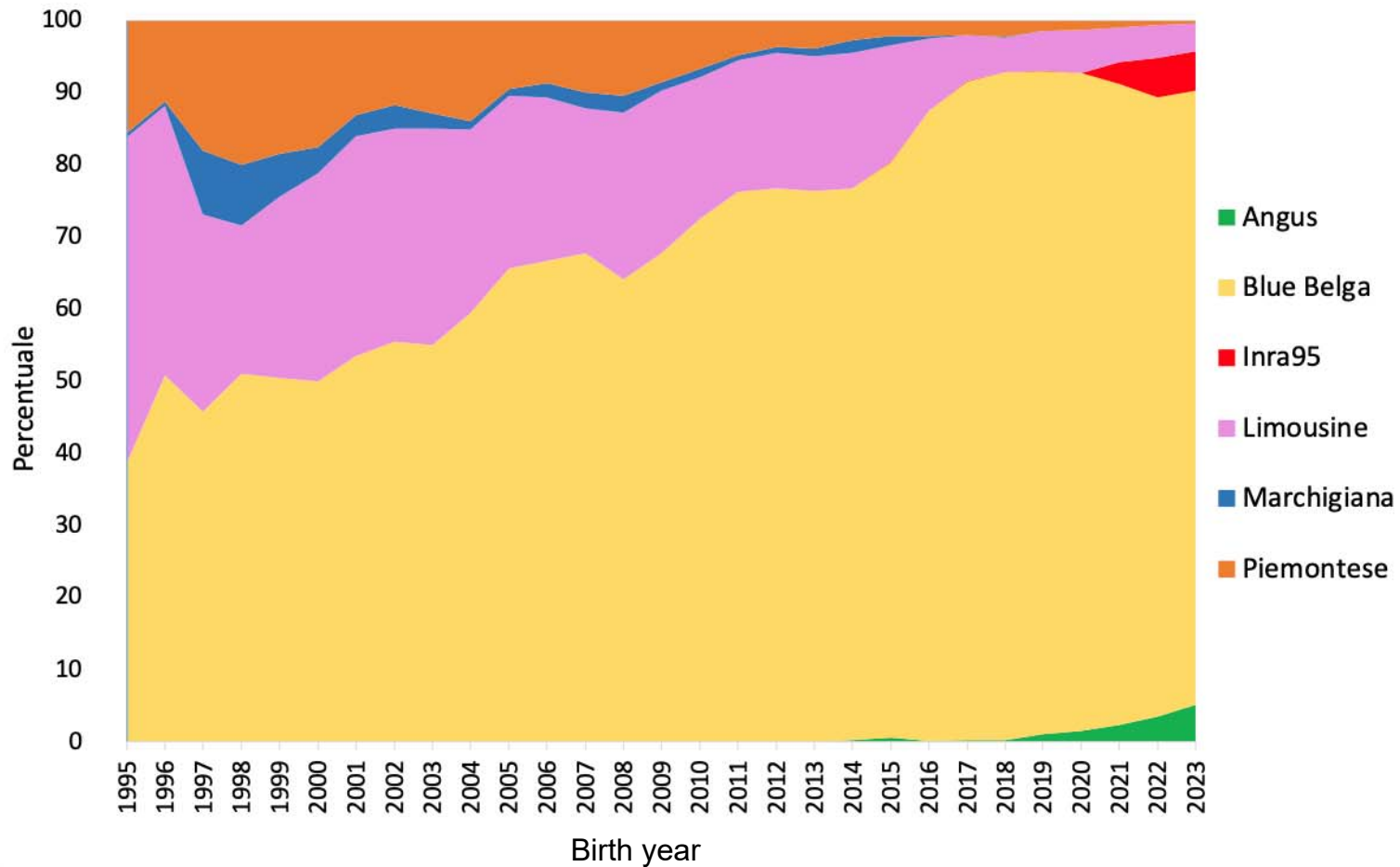
In 2030 we expected a 34% (trend is +1.6% per year)

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



Official data available on the Anafibj Ddatabase, 2024

Trend of breed of sire use for BoD in Italian Holstein population



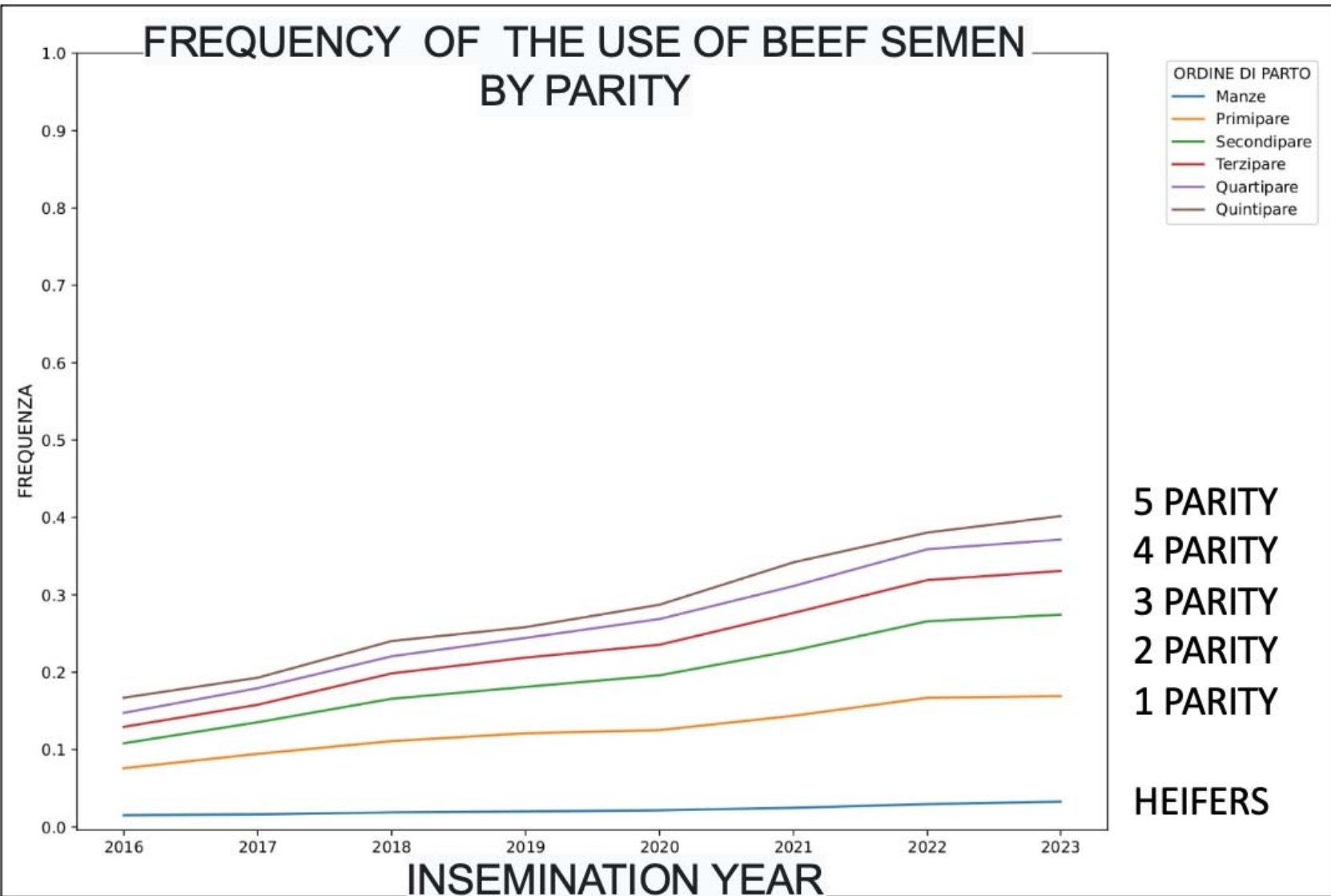
	Breed	Avg. weight	Mean /Euro/kg	Average value	
Avg. 3,1 Euro / kg	Holstein Friesian (HF)	62,9	€2,07	€144,94	P U R E
	Brown Swiss (BS)	71,1	€1,75	€124,67	
	Simmental (Sim)	72,8	€4,50	€327,79	
	Rendena	70,7	€3,64	€257,23	
	Alpine Grey (AG)	73,3	€3,65	€267,65	
Avg. 6,4 Euro /kg	BB x Brown Swiss	72,9	€6,48	€472,63	C R O S S
	BB x Holstein Friesian	72,7	€5,58	€405,66	
	BB x Simmental	73,6	€7,42	€545,70	
	BB x Rendena	73,5	€6,70	€492,59	
	BB x Alpine Grey	73,7	€6,67	€491,33	
	Lim x Brown Swiss	72,7	€5,44	€395,40	



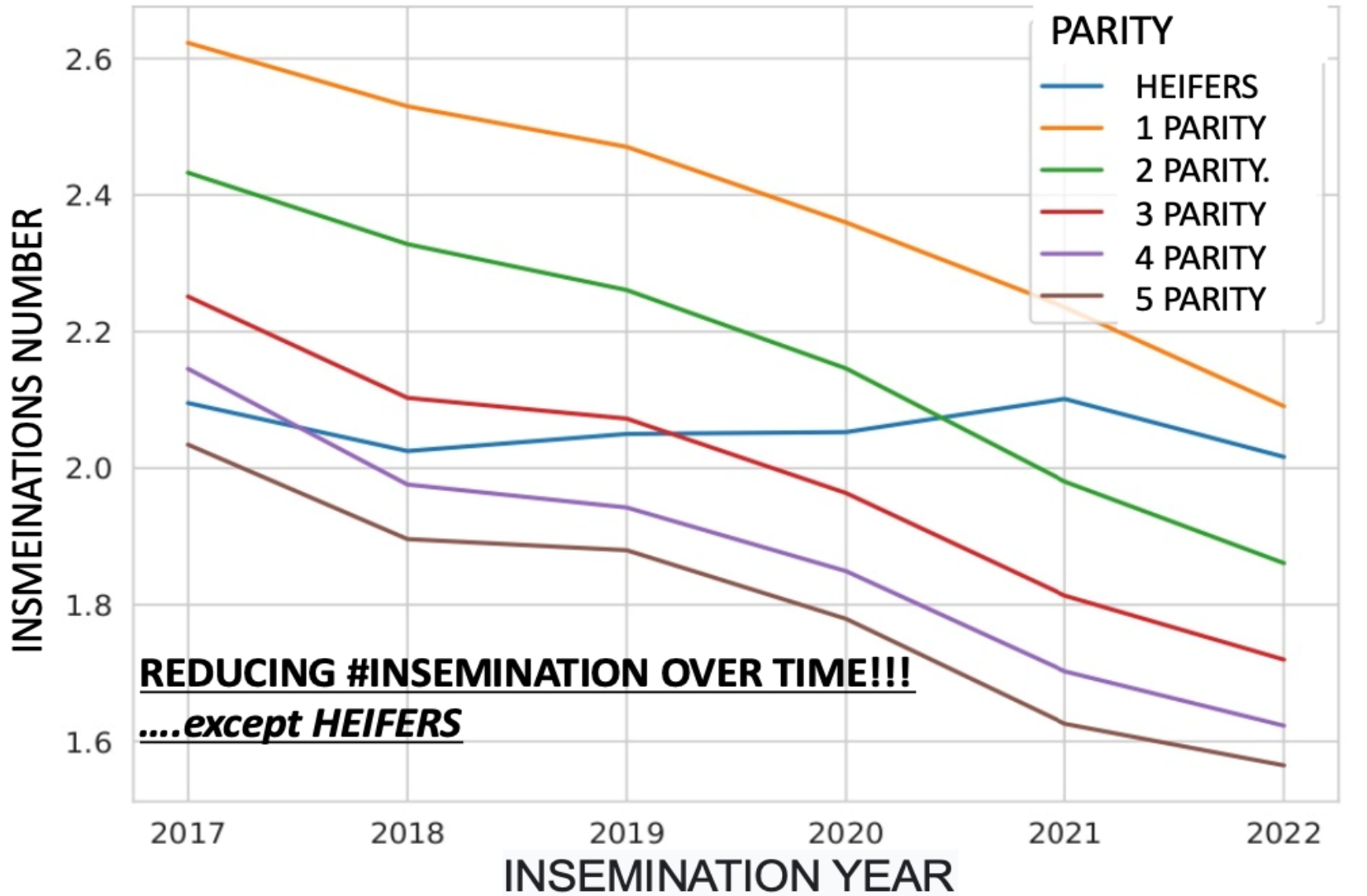
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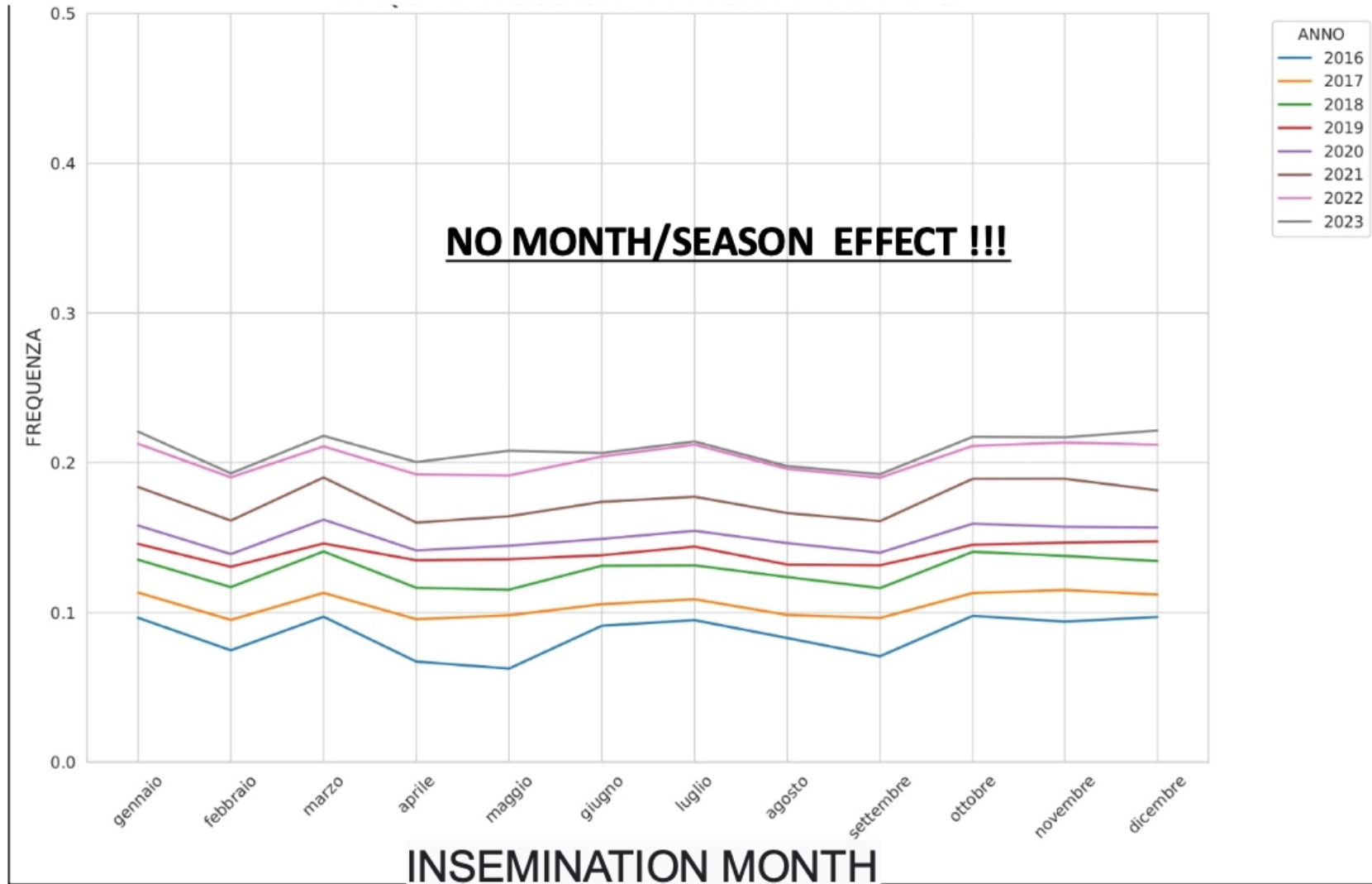
FREQUENCY OF THE USE OF BEEF SEMEN BY PARITY



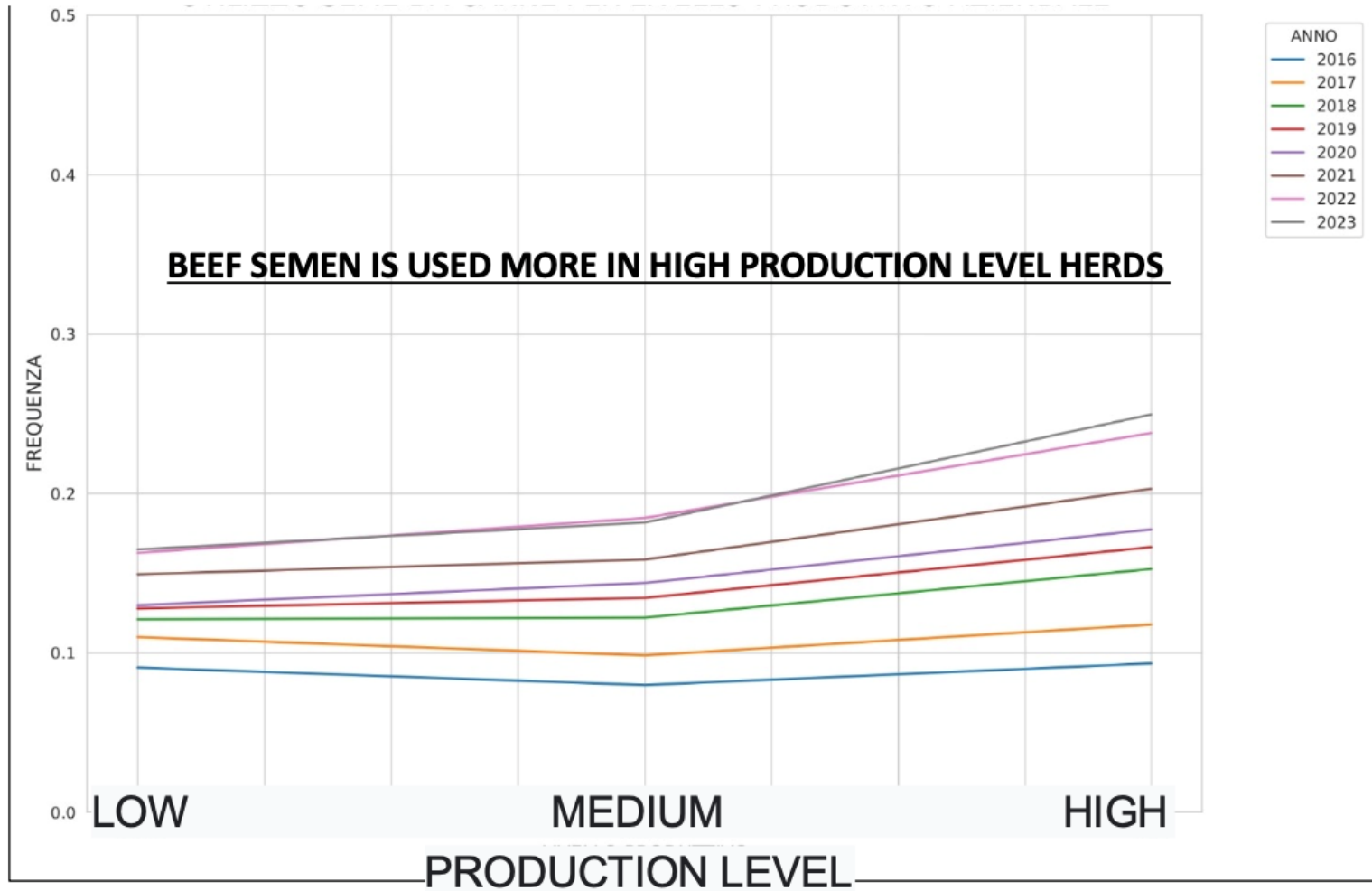
AFTER HOW MANY INSEMINATIONS IS USED THE BEEF SEMEN?



FREQUENCY OF THE USED OF BEEF SEMEN PER MONTH

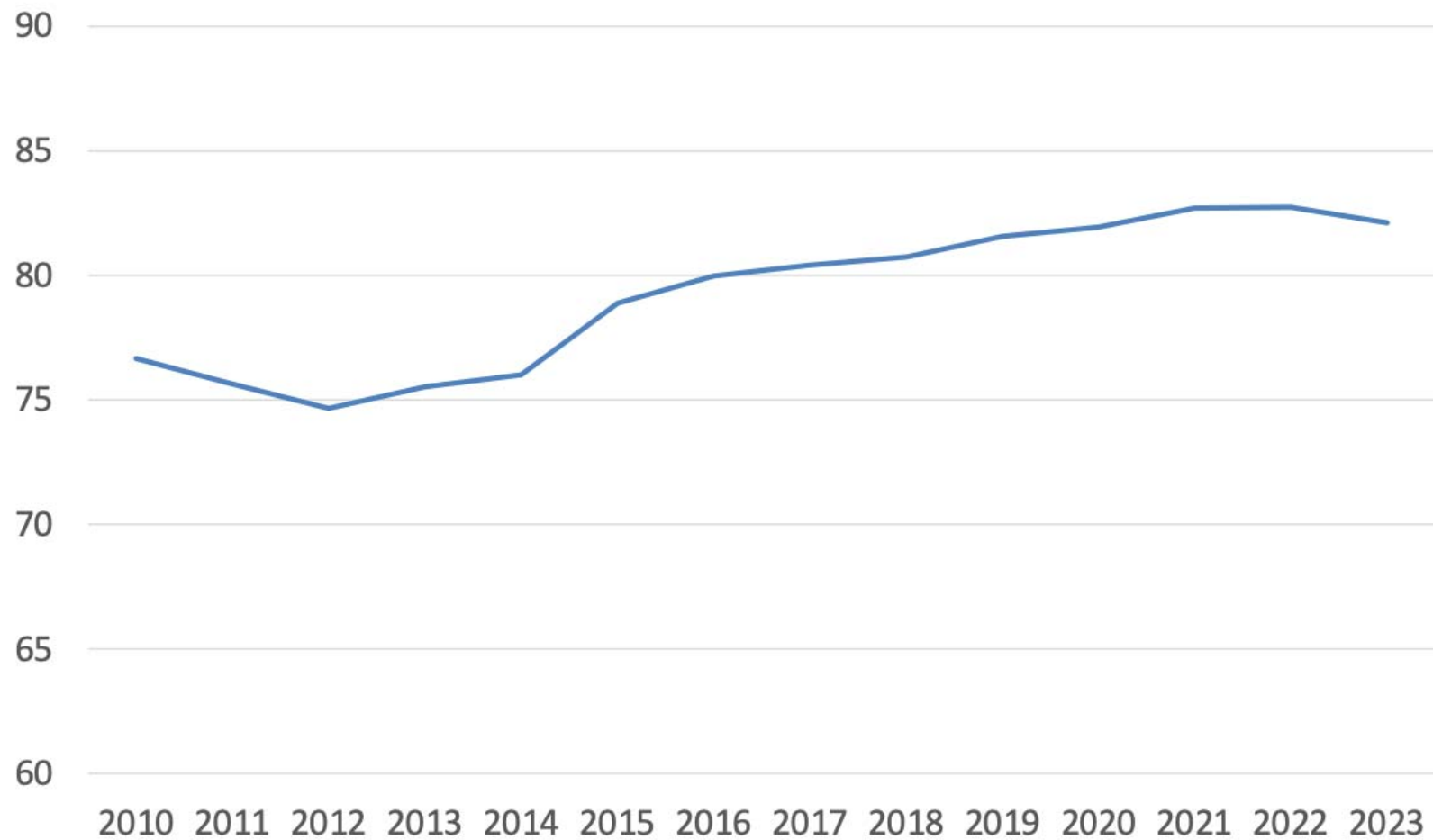


FREQUENCY OF THE USED OF BEEF SEMEN PER PRODUCTION LEVEL

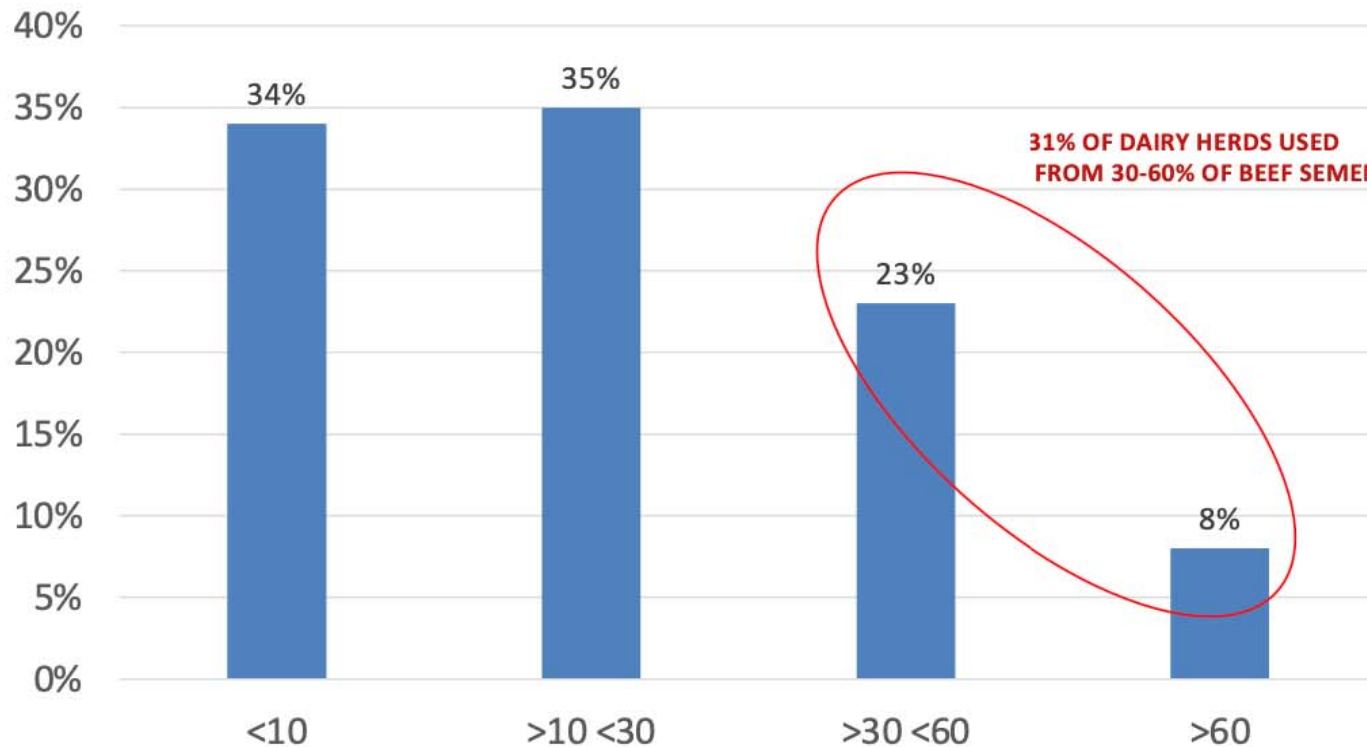




Trend of dairy herds using beef semen (%)



% 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**:
 - $18 \leq \text{cow age} \leq 40$ for parity = 1
 - $30 \leq \text{cow age} \leq 58$ for parity = 2
 - $42 \leq \text{cow age} \leq 76$ for parity = 3
 - $54 \leq \text{age of cow} \leq 94$ 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.

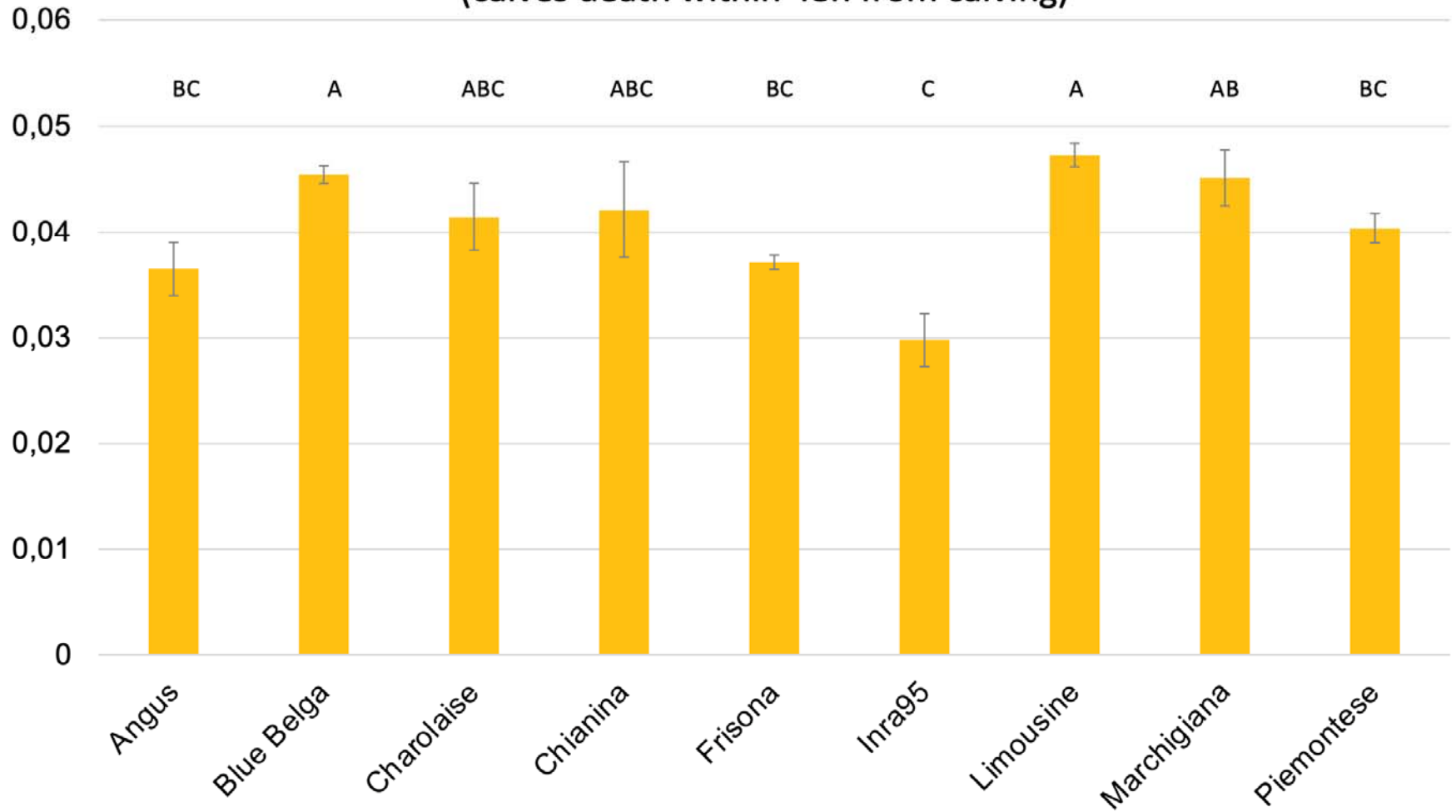
Final observations (calvings) = 807,985.

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)



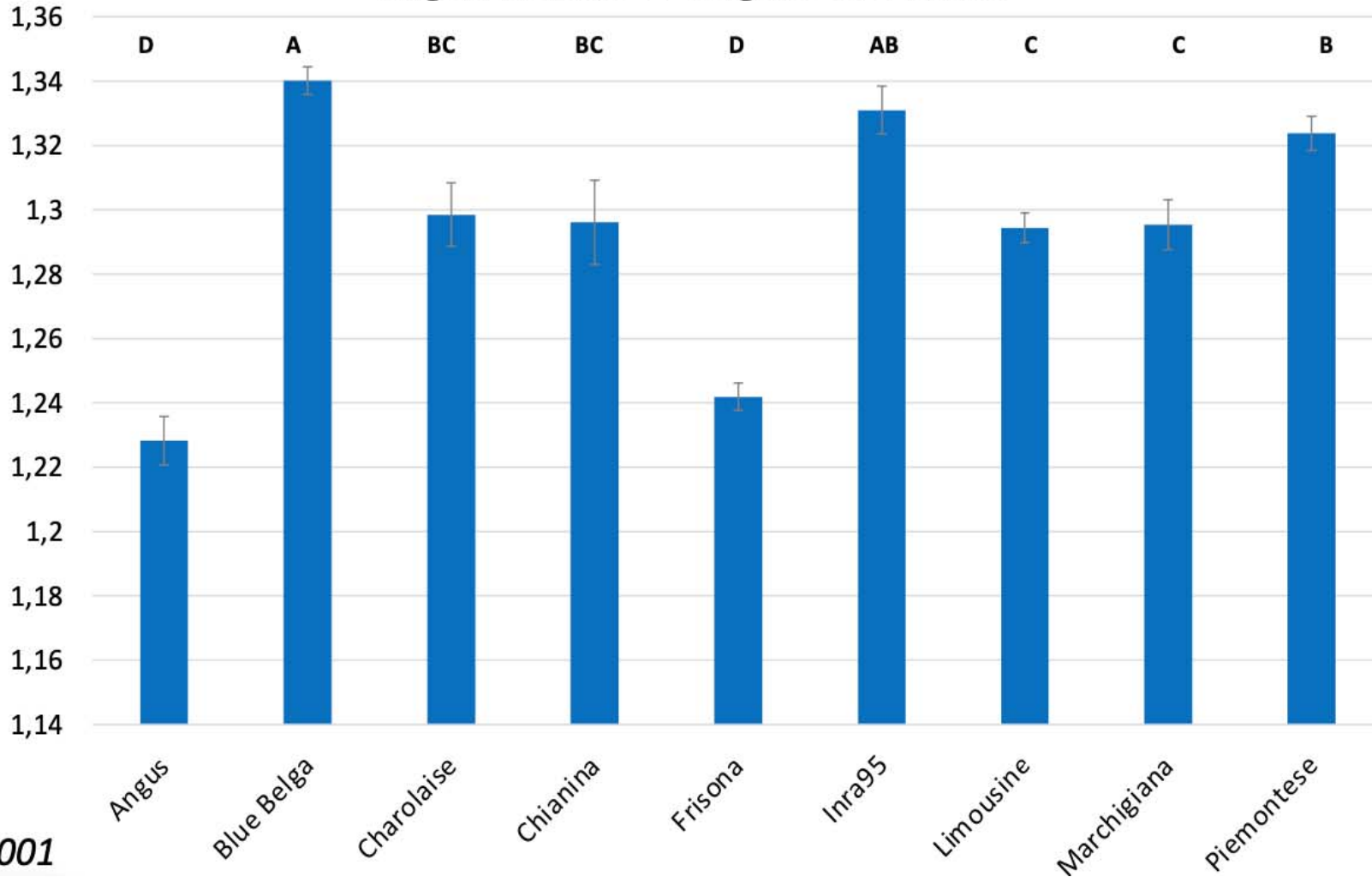
$P < 0.001$

Belgian Blue, Limousine and Marchiana >> Inra95, Holstein, Angus

CALVING EASE

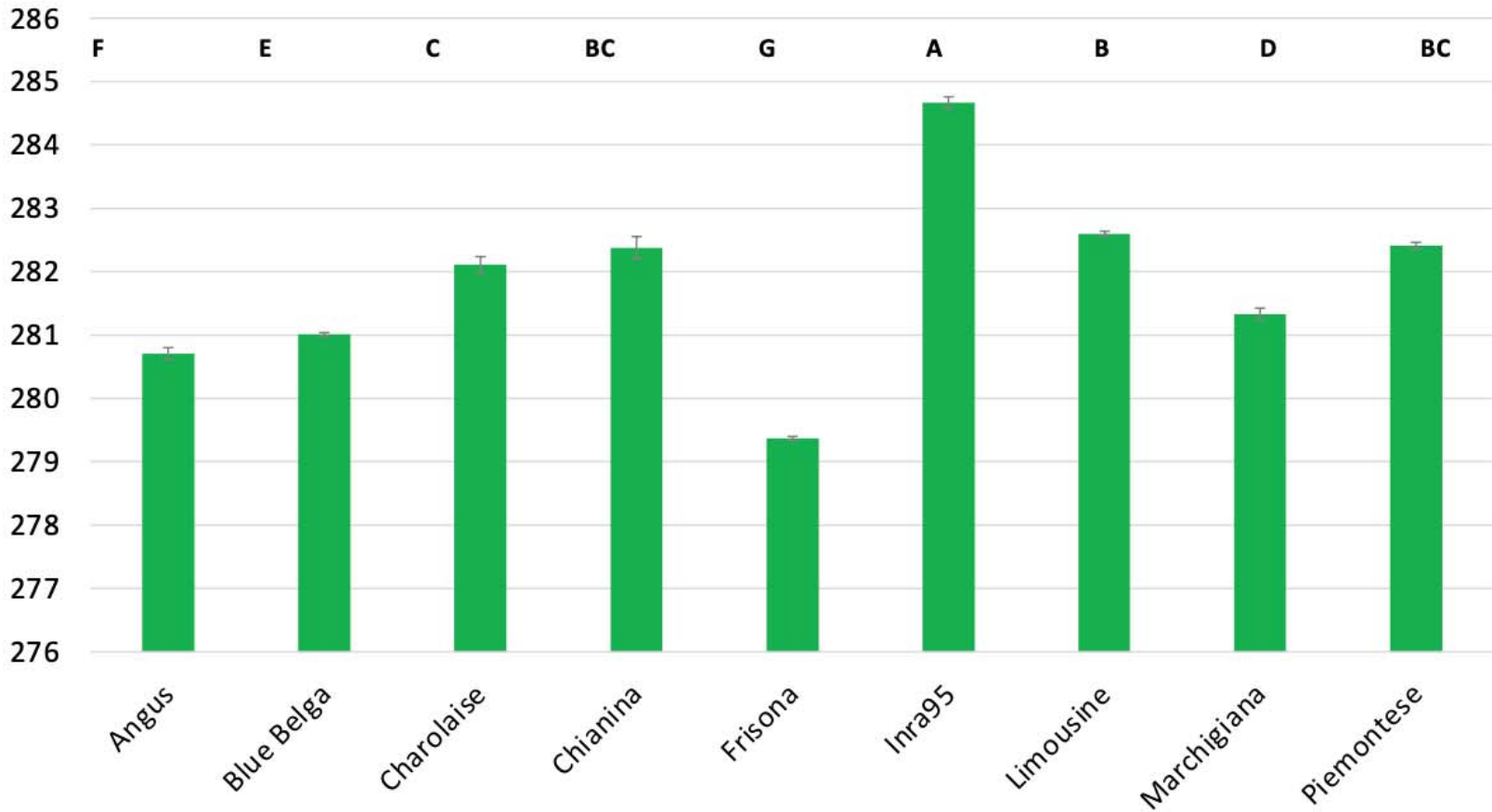
(1 = easy 2 = birth assisted by one person only 3 = cesarean section 4 = difficult part 5 = embryotomy)

Angus, Holstein >> Belgian Blue, Inra95



$P < 0.001$

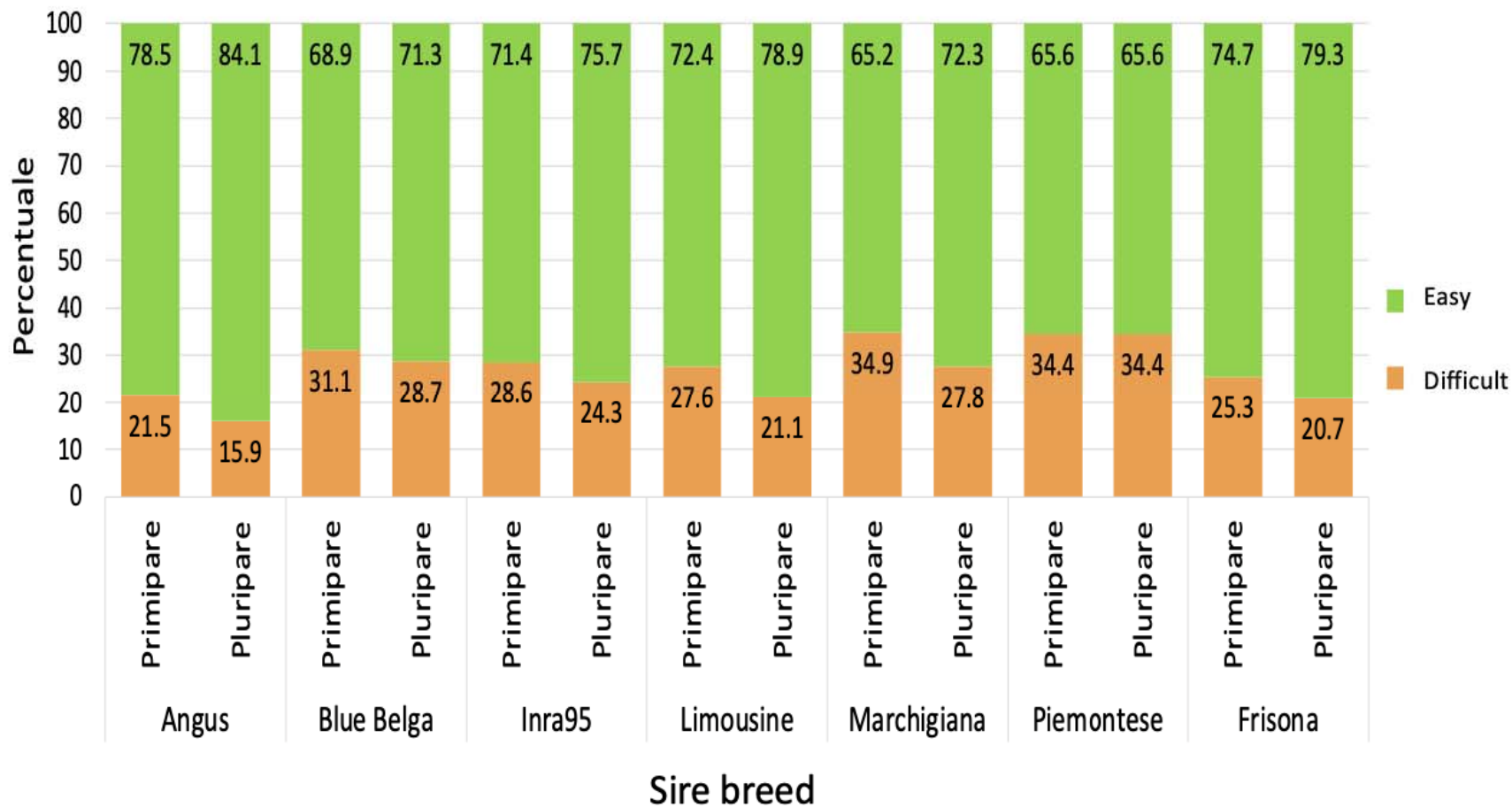
Gestation length (d)



P < 0.001

Inra95 >> Holstein (+5d)

Parity effect on Calving easy for different breed of Sire



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



Martino Cassandro



martinocassandro@anafi.it



www.anafibj.it

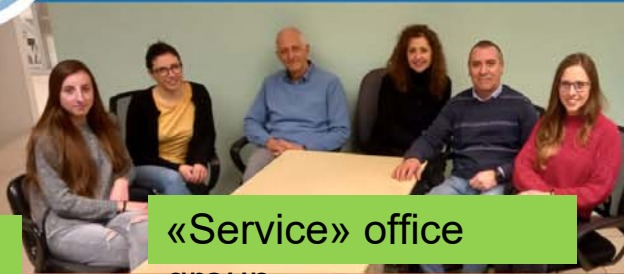




IL TEAM ANAFIBJ



Administration office group



«Service» office group



Herdbook office group



President Anafibj DG Anafibj



Genetic Center Stable Group



Conformation office group Promotion office



IT office



R&D office group



Bianconero editorial



```
class byear_calf calf_season sire_brd sex1 parity id_herd;
model sb (event='0')= byear_calf calf_season sire_brd sex1 parity id_herd/dist=binary link=logit;
random intercept / subject=id_cow;
lsmeans byear_calf calf_season sire_brd sex1 parity / ilink lines adjust=tukey;
run;

proc glimmix data = FINa1;
class byear_calf calf_season sire_brd sex1 parity id_herd;
model ce3 = byear_calf calf_season sire_brd sex1 parity id_herd;
random intercept / subject=id_cow;
lsmeans byear_calf calf_season sire_brd sex1 parity / ilink lines adjust=tukey;
run;

proc glimmix data=FINa1;
class byear_calf calf_season sire_brd sex1 parity id_herd;
model gl = byear_calf calf_season sire_brd sex1 parity id_herd/ dist=normal link=identity solution
/*link=logit solution*/;
random intercept / subject=id_cow;
lsmeans byear_calf calf_season sire_brd sex1 parity/ilink adjust=tukey lines pdiff;
run;
```

Effect of Parity, Sex, Season and Year on CALVING EASE

Tukey-Kramer Grouping for parity Least Squares Means (Alpha=0.05)

LS-means with the same letter are not significantly different.

parity	Estimate	
1	1.3359	A
5	1.2869	B
4	1.2862	B
3	1.2815	C
2	1.2813	C

Tukey-Kramer Grouping for sex1 Least Squares Means (Alpha=0.05)

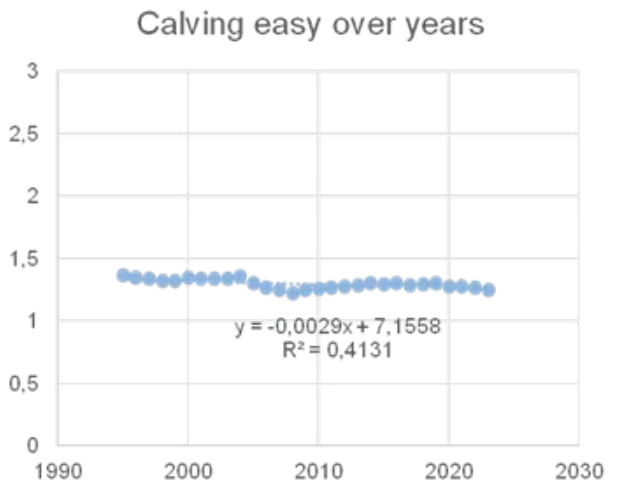
LS-means with the same letter are not significantly different.

sex1	Estimate	
male	1.3255	A
female	1.2633	B

Tukey-Kramer Grouping for calf_season Least Squares Means (Alpha=0.05)

LS-means with the same letter are not significantly different.

calf_season	Estimate		
winter	1.3007		A
autumn	1.2945		B
spring	1.2929	C	B
summer	1.2895	C	



Effect of Sex on Gestation length, Calving ease, Stillbirth

Gestation length

Tukey-Kramer Grouping for sex1 Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
sex1	Estimate	
male	282.26	A
fema	281.42	B

Calving ease

Tukey-Kramer Grouping for sex1 Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
sex1	Estimate	
male	1.3255	A
female	1.2633	B

Stillbirth

Tukey-Kramer Grouping for sex1 Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
sex1	Estimate	
male	-2.8617	A
female	-3.4821	B

Effect of Parity on Gestation length, Calving ease, Stillbirth

Gestation length

Tukey-Kramer Grouping for parity Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
parity	Estimate	
5	282.49	A
4	282.35	B
3	282.13	C
2	281.68	D
1	280.57	E

Calving ease

Tukey-Kramer Grouping for parity Least Squares Means (Alpha=0,05)		
LS-means with the same letter are not significantly different,		
parity	Estimate	
1	1,3359	A
5	1,2869	B
4	1,2862	B
3	1,2815	C
2	1,2813	C

Stillbirth

Tukey-Kramer Grouping for parity Least Squares Means (Alpha=0.05)		
LS-means with the same letter are not significantly different.		
parity	Estimate	
1	-2.8790	A
5	-3.1888	B
4	-3.2528	C
3	-3.2665	C
2	-3.2724	C