GENETIC PARAMETERS FOR REPRODUCTIVE AND LONGEVITY TRAITS IN BÍSARO PIGS

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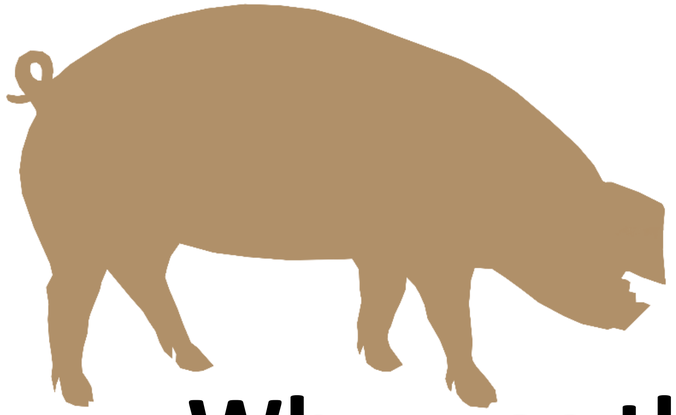

Why was this study necessary?

Endangered Portuguese native breed

Bísaro pig has gained popularity in recent years

Genetic parameters have not been evaluated before

Estimates of genetic parameters are essential in breeding programs

Breeding programs are needed to improve productivity and profit

Material & Methods

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Farrowing records / *Individual animal records* / *Traits*

$\vec{y} = X\vec{b} + Z\vec{a} + W\vec{pe} + \vec{e}$ for NBT, NBA, NSB, NBW and FIT

$\vec{y} = X\vec{b} + Z\vec{a} + \vec{e}$ for AFF, LPL, LNL, LTP and LTP365

Genetic parameters estimated via REML applied to linear mixed models

GLM to investigate the influence of factors

Limits have been set to exclude unrealistic records.

Univariate and multivariate analysis

Phenotypic values

Modest values, although consistent with previous works in this breed

Reproductive values are lower than exotic breeds

Values are similar to or greater than other indigenous breeds

9.3 NBT

Total number of piglets born per litter

8.9 NBA

Number of piglets born alive per littler

7.4 NBW

Number of piglets weaned per littler

16.8% MORT

Pre weaning mortality

1 YEAR 1 ST FARROWING

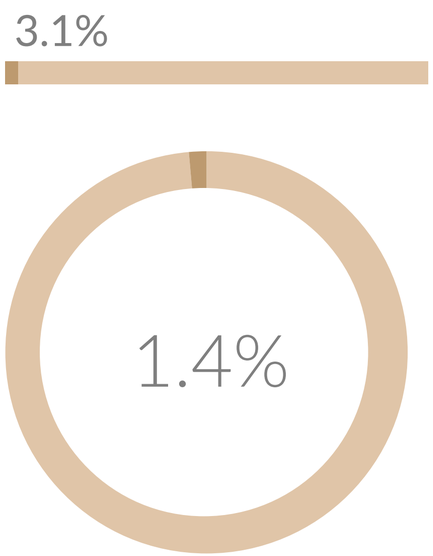
On average, the age of first farrowing happens shortly after the sow reaches one year

2.6 LITTERS

Average number of litters per sow on her lifetime

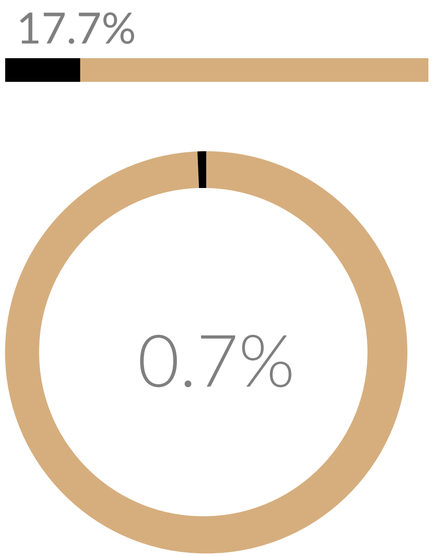
HERITABILITIES

FOR LITTER SIZE TRAITS



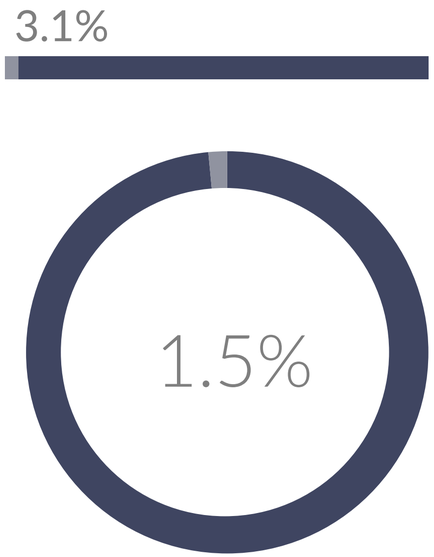
NBT

Total number of pigs born per litter



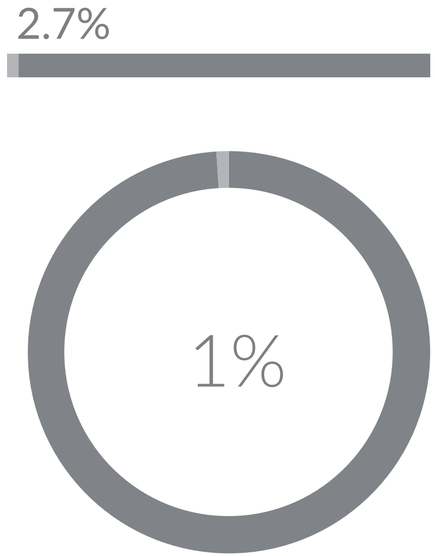
NSB

Number of stillborn



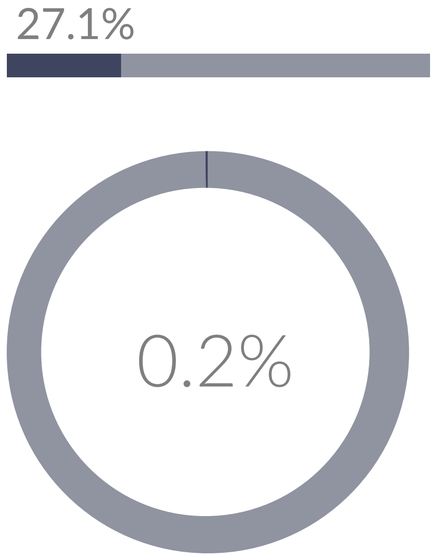
NBA

Number of pigs born alive



NBW

Number of pigs weaned per litter



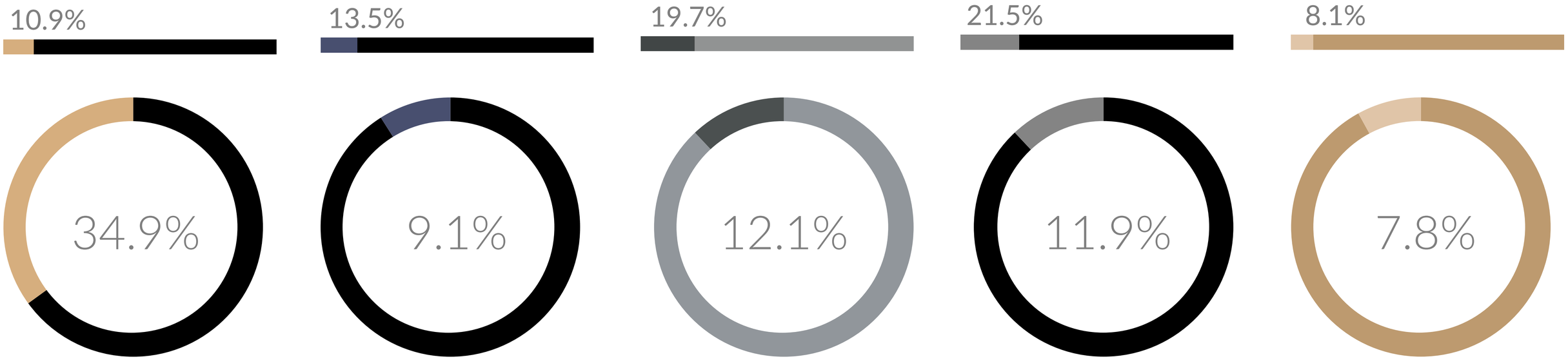
FIT

Farrowing interval

HERITABILITIES

FOR LONGEVITY AND LIFETIME PRODUCTION TRAITS

Very similar values to those from studies in other pig breeds



AFF
Age at first farrowing

LPL
Length of productive life

LNL
Lifetime number of litters

LTP
Lifetime pig production

LTP365
Lifetime efficiency

GENETIC CORRELATIONS

Estimated genetic (above diagonal) and phenotypic correlations (below diagonal), and respective standard errors

	NBT	NSB	NBA	NBW
NBT		0.352±0.323	0.968±0.024	0.974±0.110
NSB	0.361±0.005		0.107±0.368	-0.010±0.402
NBA	0.934±0.001	0.005±0.006		0.945±0.068
NBW	0.623±0.004	-0.126±0.006	0.717±0.003	

GENETIC CORRELATIONS

Estimated genetic (above diagonal) and phenotypic correlations (below diagonal), and respective standard errors

	LPL	LNL	LTP	LTP365
LPL		0.929±0.003	0.948±0.037	0.811±0.155
LNL	0.873±0.004		0.969±0.014	0.920±0.098
LTP	0.818±0.005	0.946±0.002		0.899±0.076
LTP365	0.266±0.014	0.506±0.011	0.677±0.008	

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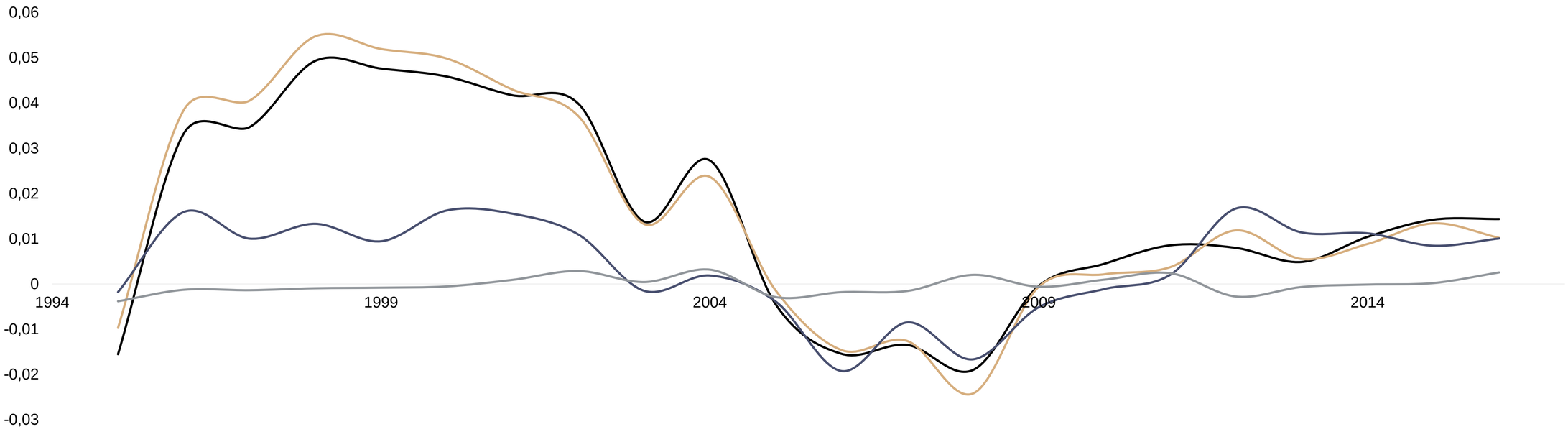
2019

GENETIC TRENDS

The genetic trends were calculated by the linear regression of the estimated breeding values (EBV) over time and represented graphically through the mean EBV of animals with reproductive phenotypic values, by year of birth of the sow



01

NBT

Similar pattern with NBA

Mean EBV increased **0.03**

Small negative genetic trend

$-1.5x10^{-3}$ (P<0.001)

02

NBA

Similar pattern with NBT

Mean EBV increased **0.02**

Small negative genetic trend

$-1.7x10^{-3}$ (P<0.001)

03

NBW

Mean EBV increased **0.01**

Negligible positive coefficient

$4.8x10^{-4}$ (P<0.001)

04

NSB

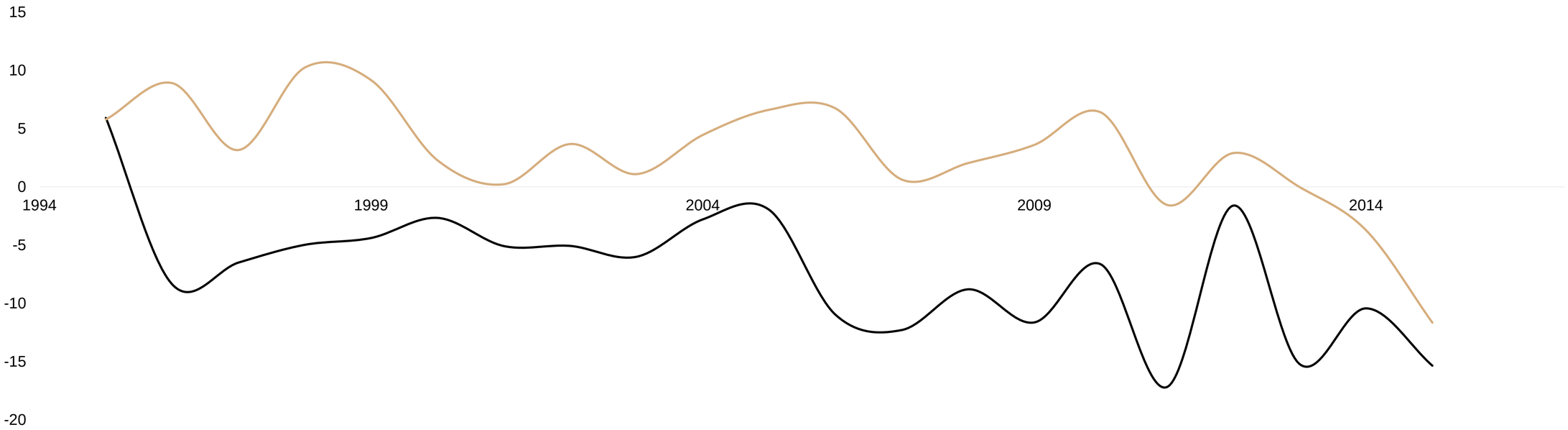
No significant changes

Negligible positive coefficient

$2.8x10^{-6}$ (P<0.001)

GENETIC TRENDS

Estimated average genetic values of FIT, LNL, LTP and LTP365 did not present considerable fluctuations over time and regression coefficients were negligible



01

AFF

Mean EBV decreased **21.3**

Negative genetic trend **-0.6** (P<0.001)

02

LPL

Mean EBV decreased **17.5**

Negative genetic trend **-0.4** (P<0.001)

TAKE HOME MESSAGE

- Litter size traits have **low heritability**
- Low heritabilities do not necessarily imply low genetic variance – **animal selection is possible**
- Longevity, productivity and efficiency traits have considerable heritability
- **NBA should be prioritize over NBT** when selecting for litter size
- Longevity and lifetime production traits were strongly related between them
- Genetic trends show no significant changes in the last two decades
- **Large unexplored genetic potential**
  Piglets represent the majority of production → **greater impact on the farm's productivity and farmer's profit.**

GRATEFUL FOR YOUR ATTENTION

OINK

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