



SOW MATERNAL CHARACTERISTICS OF TWO GENOTYPES IN AN OUTDOOR FARROWING SYSTEM

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BACKGROUND ...

- Organic production in DK: Outdoor
 - Farrow in small individual huts on a paddock
 - Limited possibility for management of large litter size- eg. nurse sows
 - Current mortality: Avg.29.5 % of total born (Rangstrup- Christensen, 2018, Res. Vet. Sci. 118)
- Current genotype used in DK organic:
 - Highly prolific LY crosses from Danbred: Avg. 18.7 totalborn pig per litter
 - Selected for high number of live pigs day5, under indoor conditions
 - Intensive management needed to ensure survival of piglets



CHOICE OF ALTERNATIVE GENOTYPE ?

Organic producers in DK looks for an alternative genotype

- Lower mortality due to welfare being an important image of the organic label
- Higher birth weight to increase robustness
- Sow should be able to take care of all her own piglets without use of nurse sows
- Still ask for a prolific sow

Match better the breeding goal of Topics Norsvin TN70

- balanced breeding goal including litter size, teat number, birth weight and survival

Is TN70 a better alternative in the outdoor organic production ?

AIMS

- Identify sow and piglet characteristics of importance for early mortality in outdoor production in two genotypes
- Investigate differences in these characteristics between the two genotypes

METHODS: ANIMALS

- Compare 22 DanBred and 25 Topigs Norsvin TN70 in a well controlled experimental set-up
- Animals arrived at research farm at an age of 16-20 wks
- Housed, fed and managed under similar condition until first farrowing
- Inseminated with known Danbred Duroc semen in a balanced design



METHODS: DATA SAMPLING

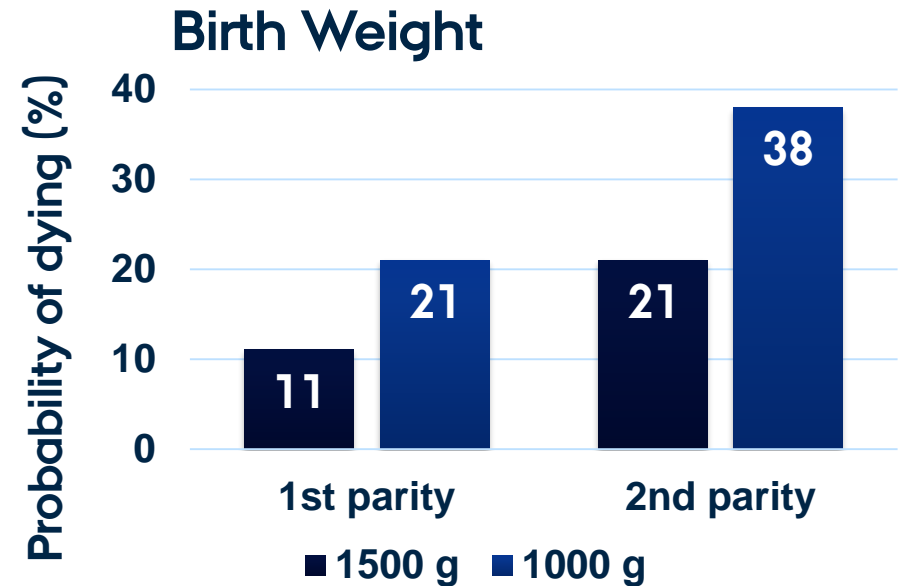
- Data collection during 1st and 2nd parity
- Litters were equalized within genotype up to number of functional teats
- Birth weight < 700 g = euthanized
- No use of nurse sows - need to euthanize surplus piglets (smallest)
- Farrowed in two types of huts (balanced design)



CHARACTERISTICS RELATED TO RISK OF DEATH

Same for both genotypes:

- Large litter ($P < 0.01$)
- Low birth weight ($P < 0.001$)
- Low body temperature at 24 h ($p < 0.05$)
- IUGR pigs (Odds ratio 2- fold higher in IUGR pigs)



DIFFERENCES BETWEEN GENOTYPES

Less totalborn pigs in TN70

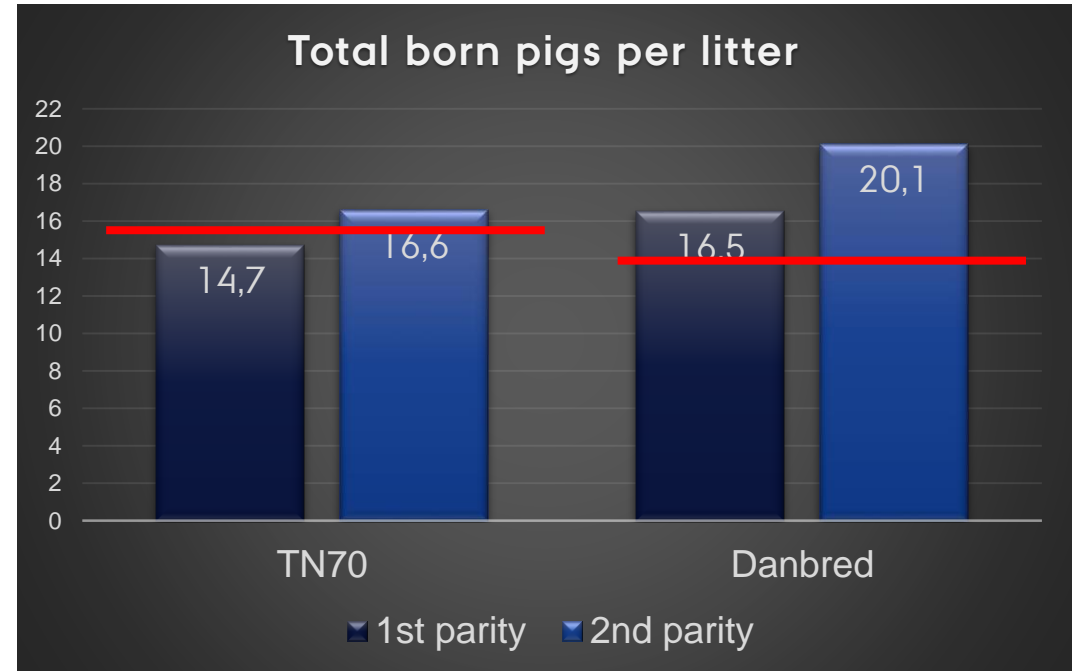
Diff: 2.7 pigs less per litter (P=0.003)

More functional teats in TN70 (P<0.0001)

TN70: 15.4

Danbred: 14.1

Weaned same number of piglets (11.7 pigs per litter)



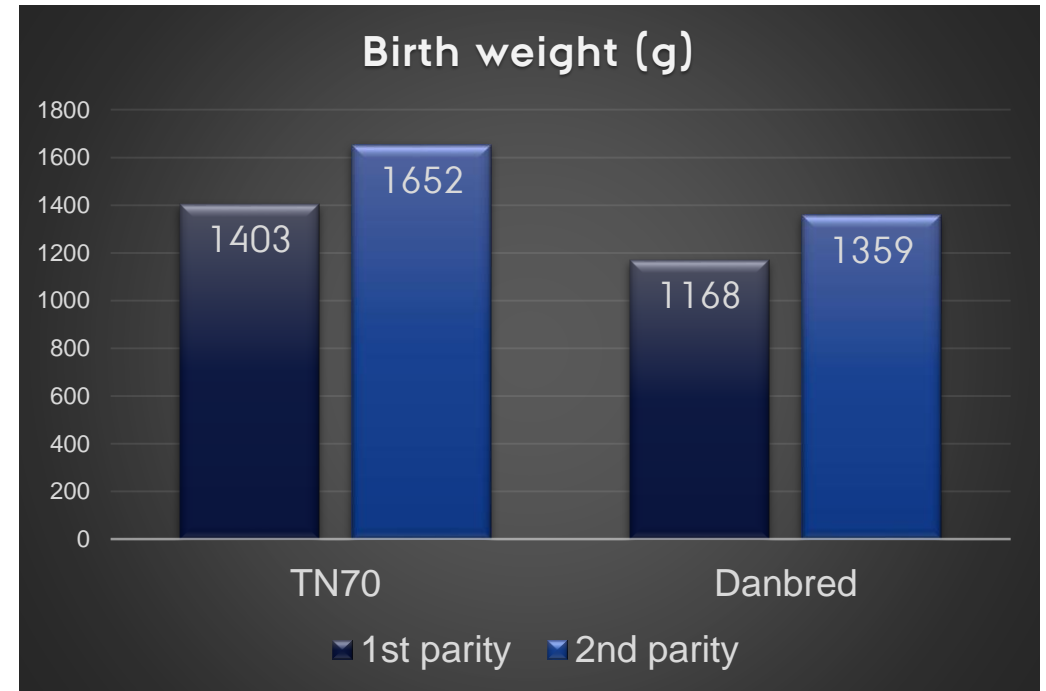
Teat number in TN70 matched liveborn in 1st and 2nd parity

DIFFERENCES BETWEEN GENOTYPES

Higher birth weight in TN70 : (P<0.0001)

Higher body temperature day 1 in TN70 :
Difference 0.3°C (P=0.02)

Lower probability of IUGR pigs in TN70 :
1 (TN70) vs 2.6 (Danbred) pig per litter
(P=0.0003)



Higher weaning weight in TN70 : 1.3 kg per pig (P=0.0004)

TN70 gave birth to heavier pigs and fewer IUGR pigs

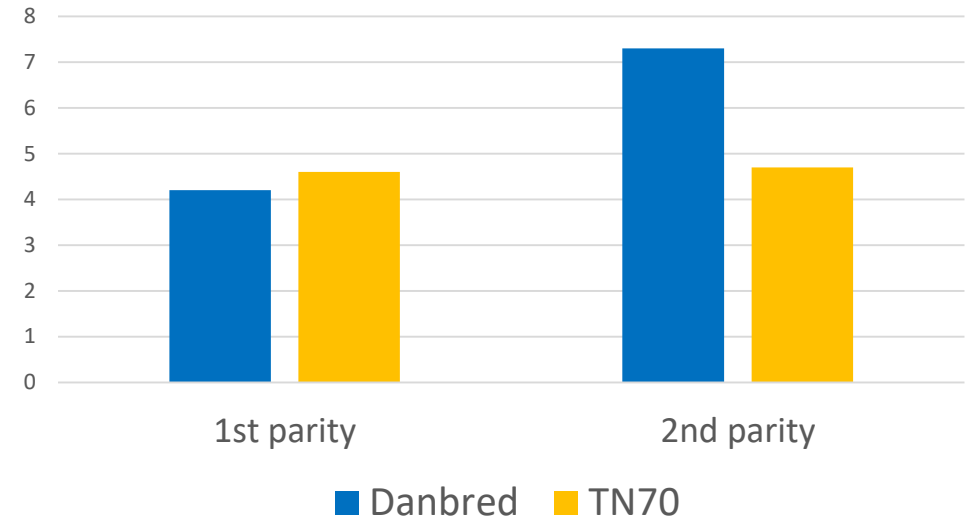
COURSE OF FARROWING

Observation of farrowing duration:

Long farrowing duration => high risk of stillbirth

No difference between genotypes

Mean duration of farrowing (h)

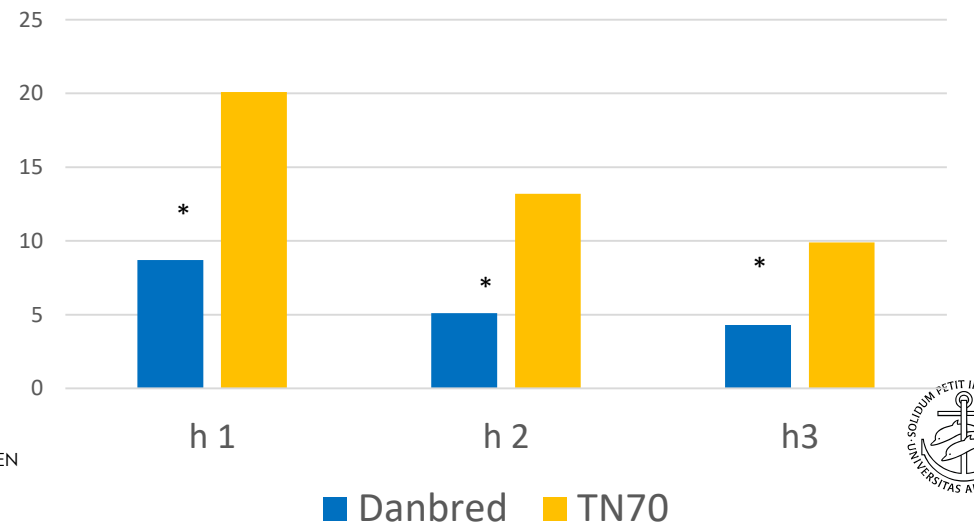


Observation of behaviour first 3 h of parturition:

High number of posture changes \neq high risk of early mortality

TN70 had more posture changes and less lateral lying

Mean hourly posture changes 1st parity



MATERNAL PROTECTIVENESS

Direct observation for 10 min during castration of piglets behind a barrier:

Score for agitation:

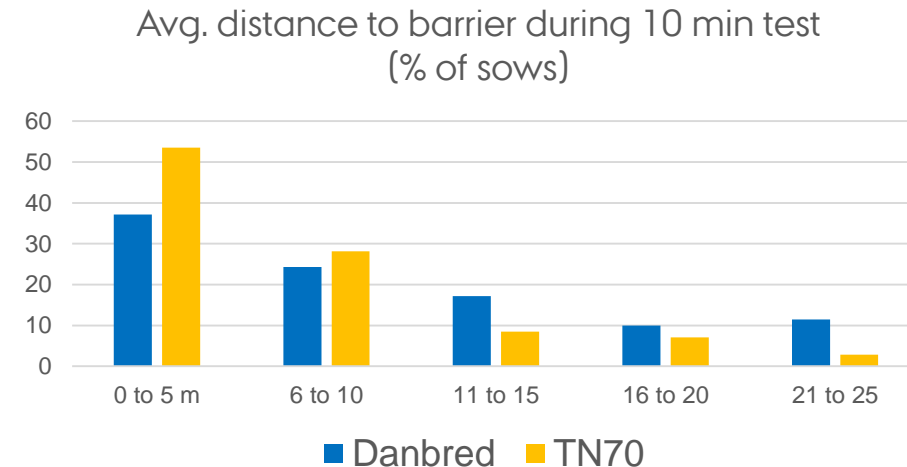
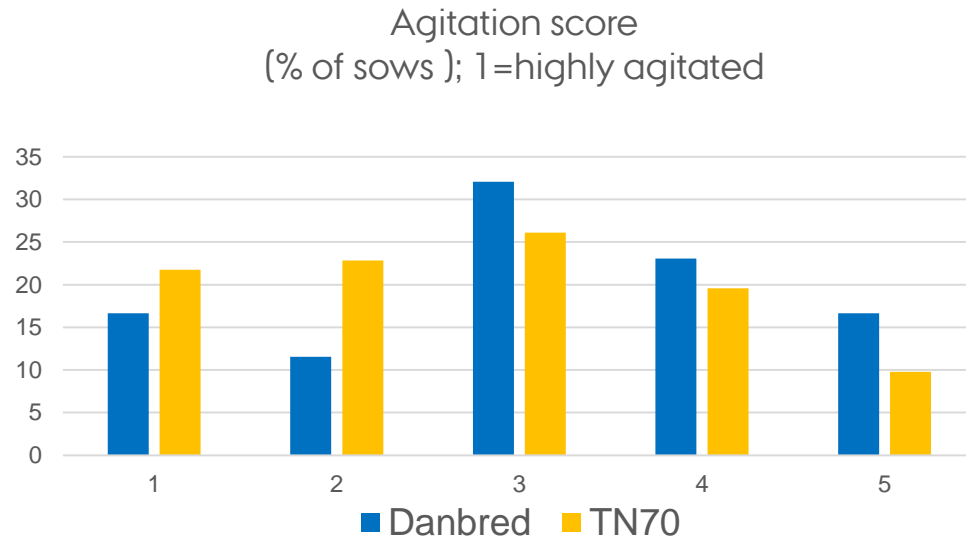
1: Strongest reaction: biting/pushing barrier and strong vocalization

5: No reaction - sow moves away from barrier

Distance to the barrier:

Higher agitation in TN70 ($P < 0.05$)

Shorter distance to barrier in TN70 ($P < 0.05$)



TN70 may have a more protective mothering style. Good or bad ?

CONCLUSION

Large litters, low birth weight, low body-temp and IUGR were related to high risk of death in outdoor production herd

Comparison of genotypes:

- TN70 were less prolific and had more teats
- TN70 piglets had higher birth weight and weaning weight
- TN70 had fewer IUGR piglets in the litter

They seem to match better the demand of the organic producer with a good potential to reduce mortality

A new study will include higher parities and mortality rates in three organic herds

Investigate further the importance of difference in maternal behaviour for risk of mortality

THANK YOU FOR YOUR ATTENTION

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