

Hittestress bij

legghennen

Effecten en oplossingen

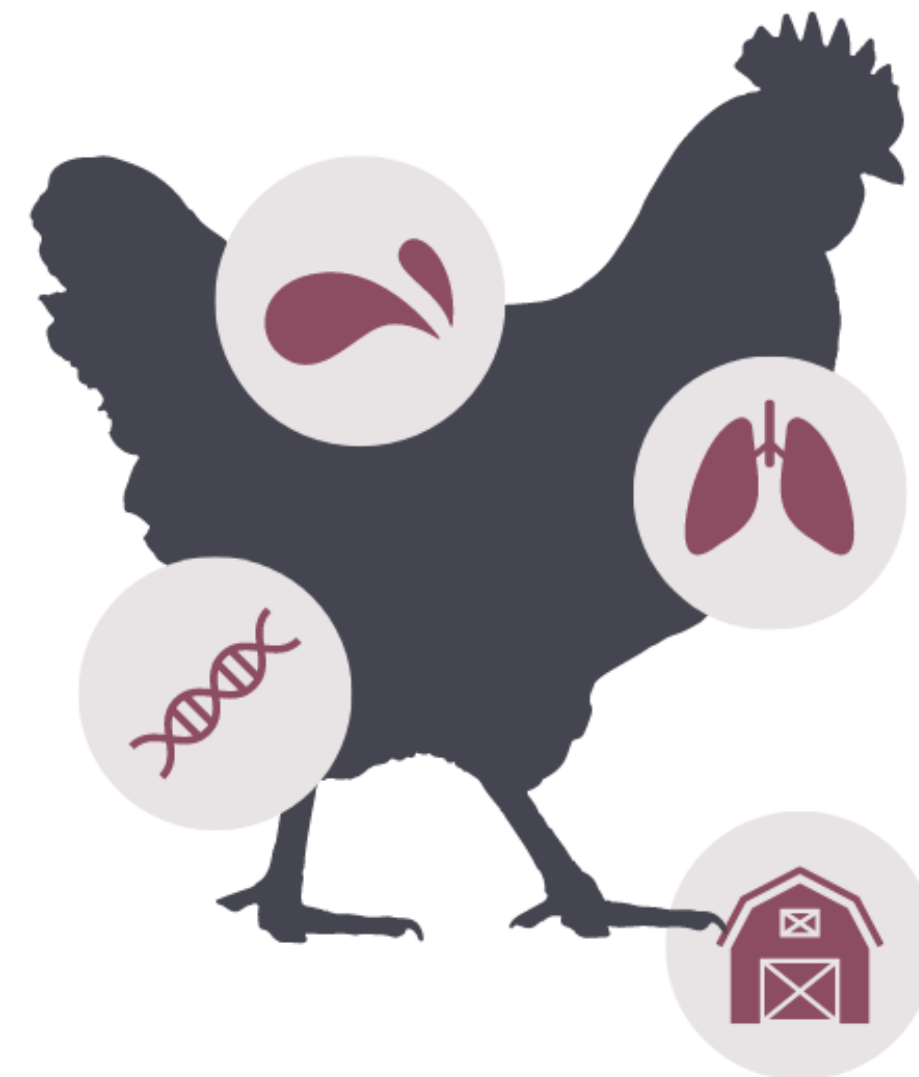


Met steun van:

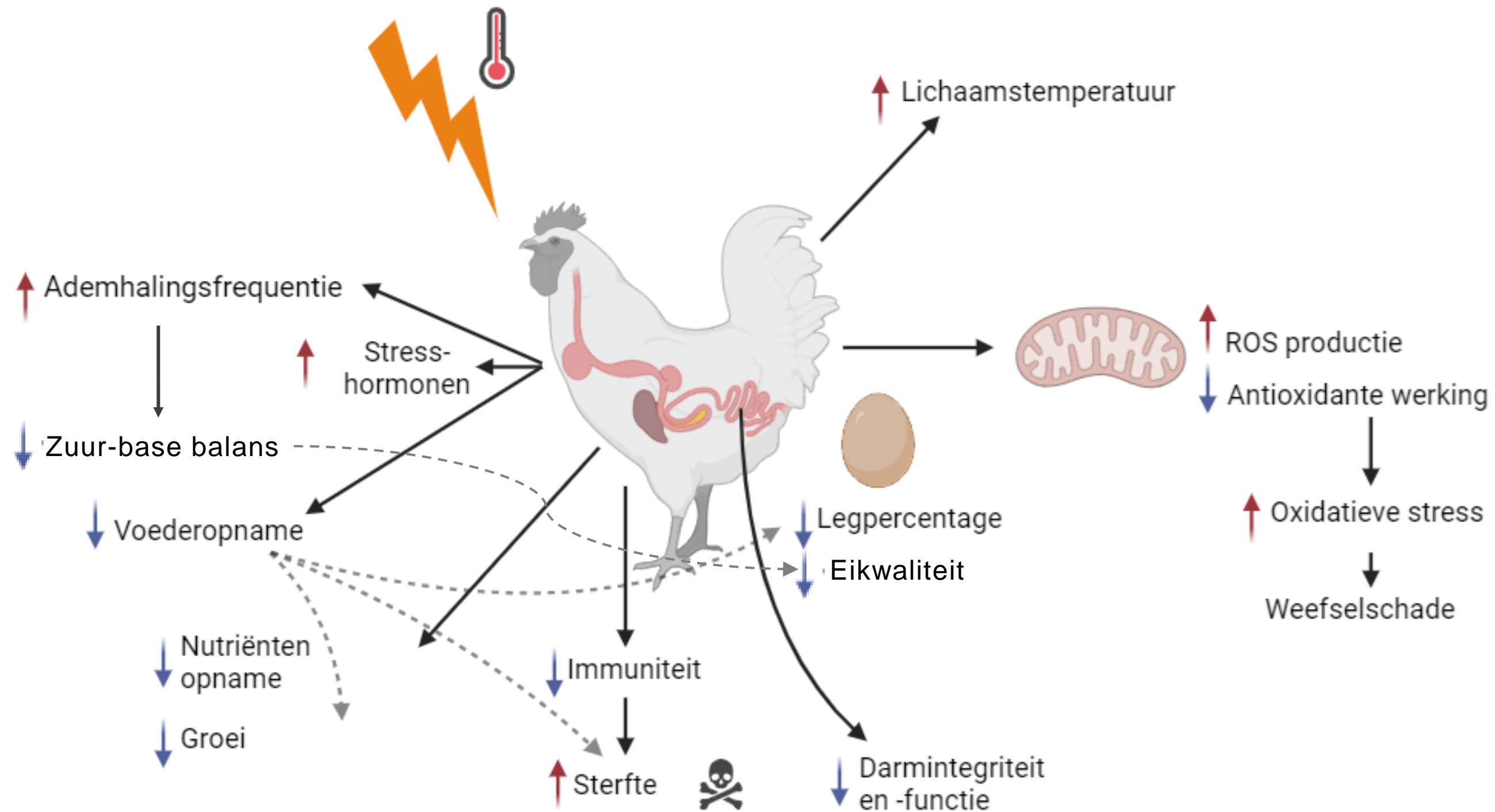


HITTESTRESS

- Pluimvee gevoelig voor hittestress door verschillende eigenschappen:
 - Gebrek zweetklieren
 - Bevedering
 - Selectie op hoge productiviteit
 -



HITTESTRESS



Gevolg: ↓ dierenwelzijn, ↓ voederopname, ↓ eikwaliteit, productieverliezen, sterfte

COOLCHICKS



verneveling



wateradditieven



voedersamenstelling



voederrestrictie



voederadditieven



genetica



padkoeling



instellingen



ventilatiereductie



lichtschema





LEGHENNENPROEF

Effect van betaine en voederrestrictie
tijdens hittestress bij twee rassen
leghennen

PROEFOPZET

06/03/2023 – 17/04/2023

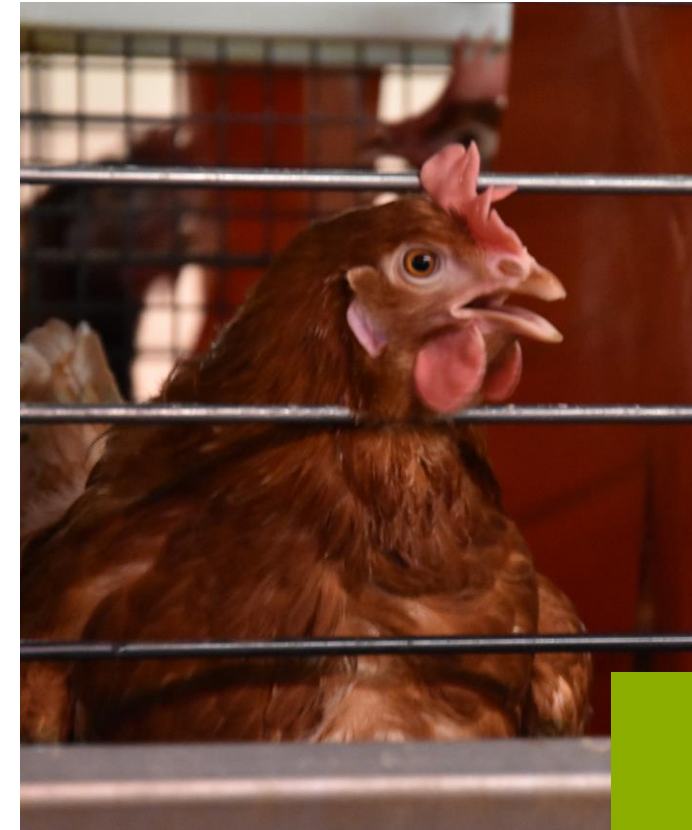
Ras

Helft bruin (Isa Brown)

Helft wit (Lohman LSL Classic)

Behandelingen

- 1) Voederrestrictie
- 2) Betaine
- 3) Voederrestrictie + betaine
- 4) Controle

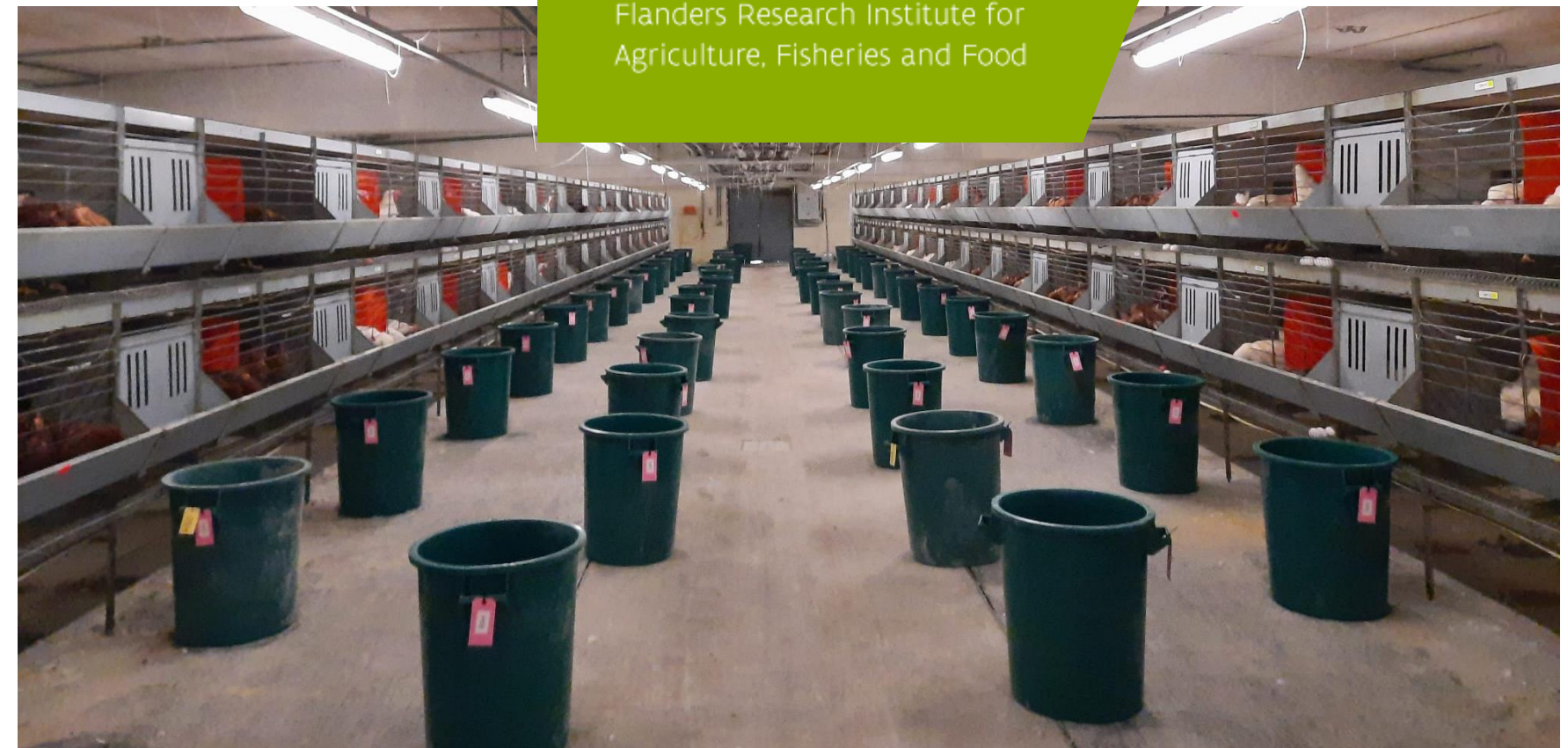


VS



ILVO

Flanders Research Institute for
Agriculture, Fisheries and Food



BEHANDELINGEN

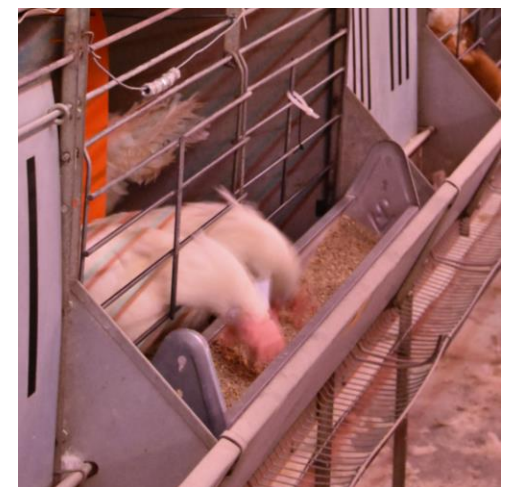
Betaine (0,55 g/L)

- Osmolyt en methyl donor
 - Antioxidant
- Betaine hydrochloride
 - In drinkwater

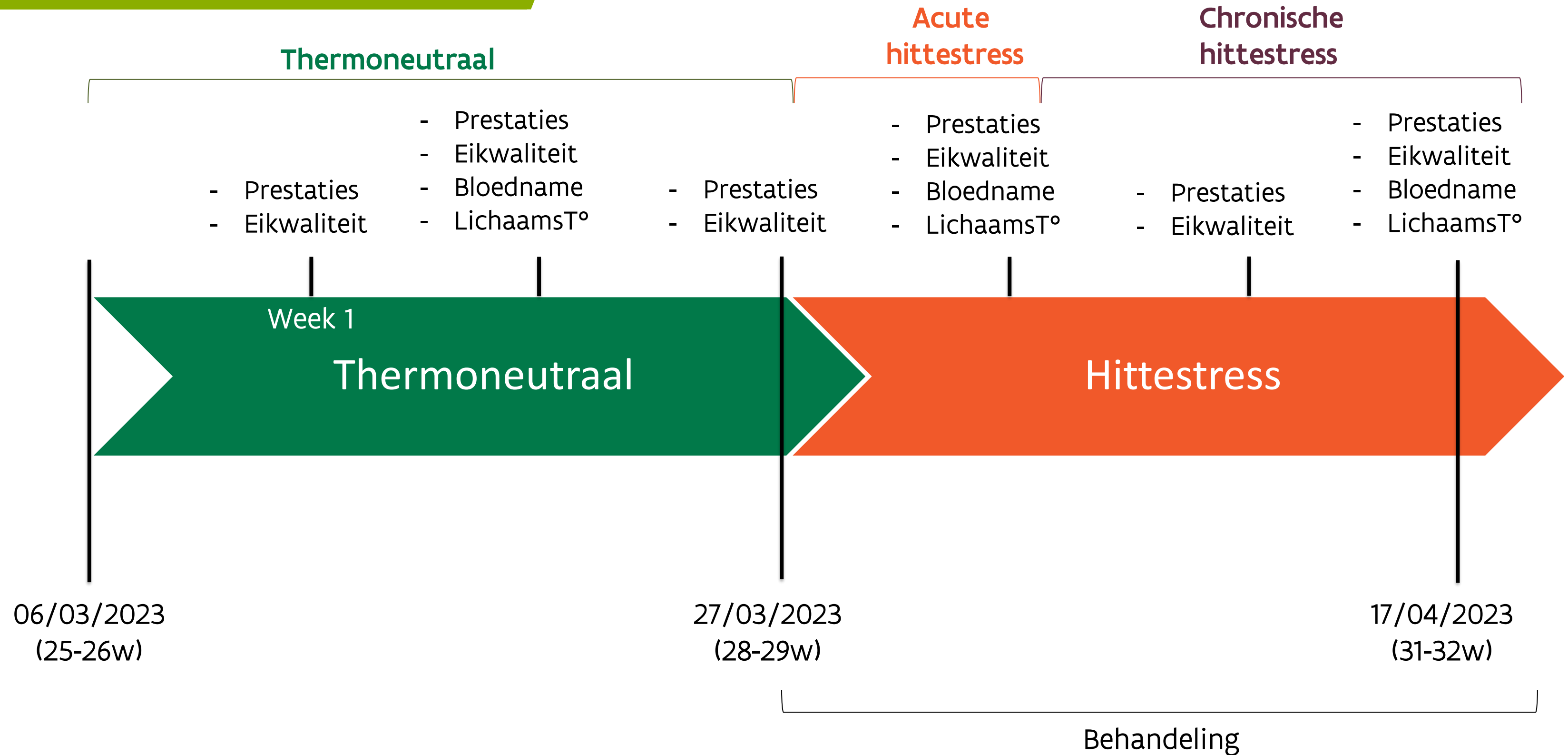


Voederrestrictie

- Tijdens warmste momenten (11u30 – 15u30)
- Minder metabole warmteproductie door vertering
 - Behoud zuur-base balans

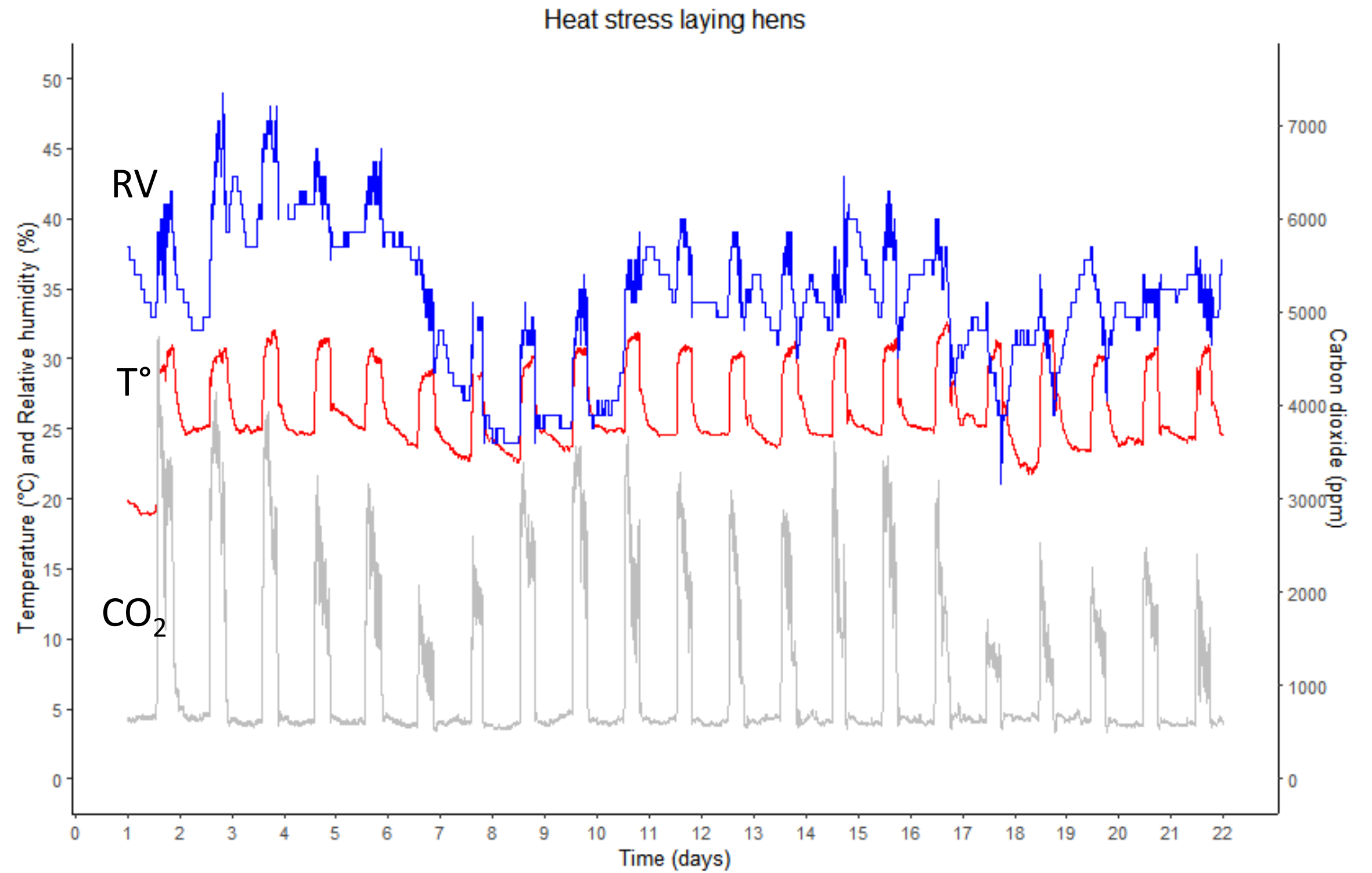
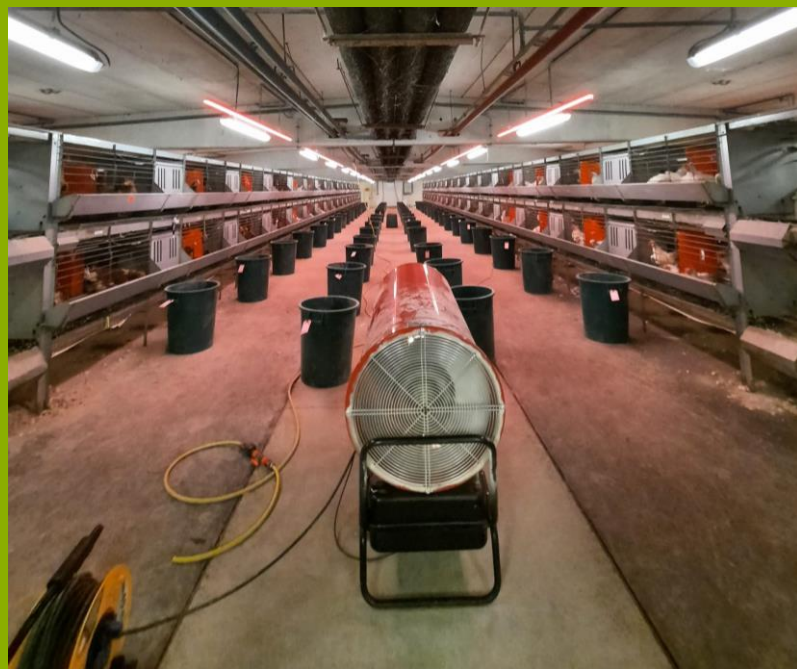


OVERZICHT



STALKKLIMAAT

- 9u30 – 15u30

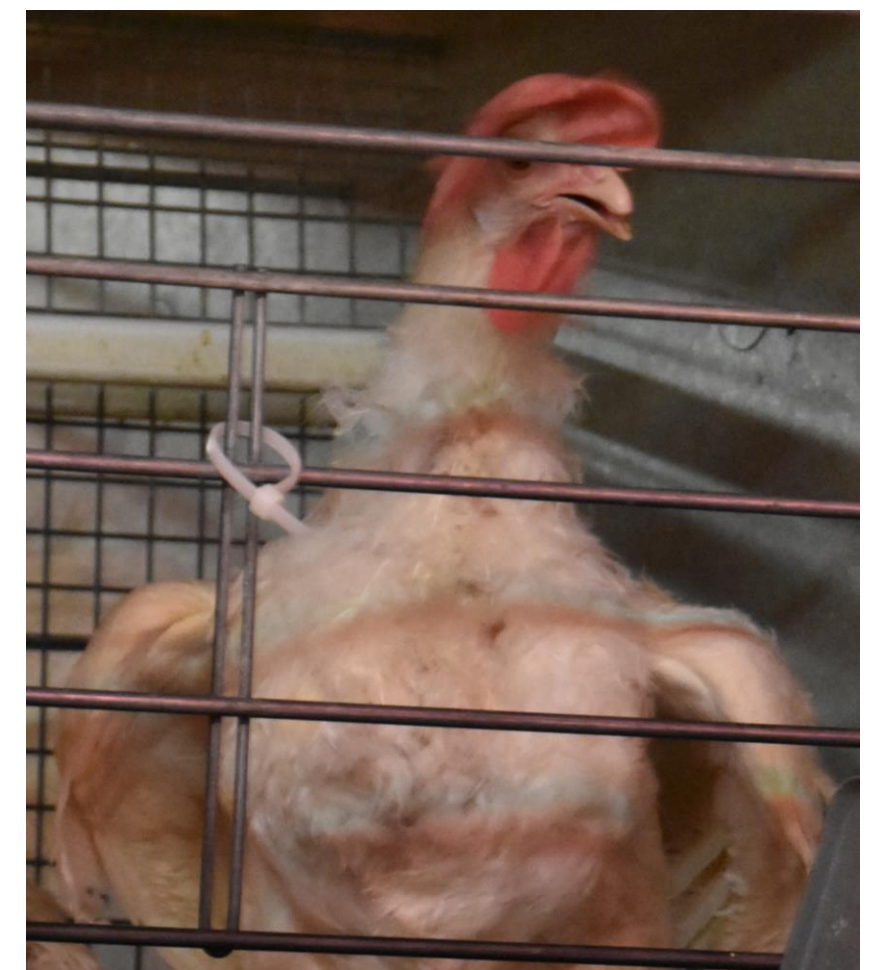


GEDRAG

Visueel:

- Hijgen
- Vleugels spreiden
- Meer neerliggen

MAAR, kunnen we dit ook bewijzen?



Werkt hittestress?

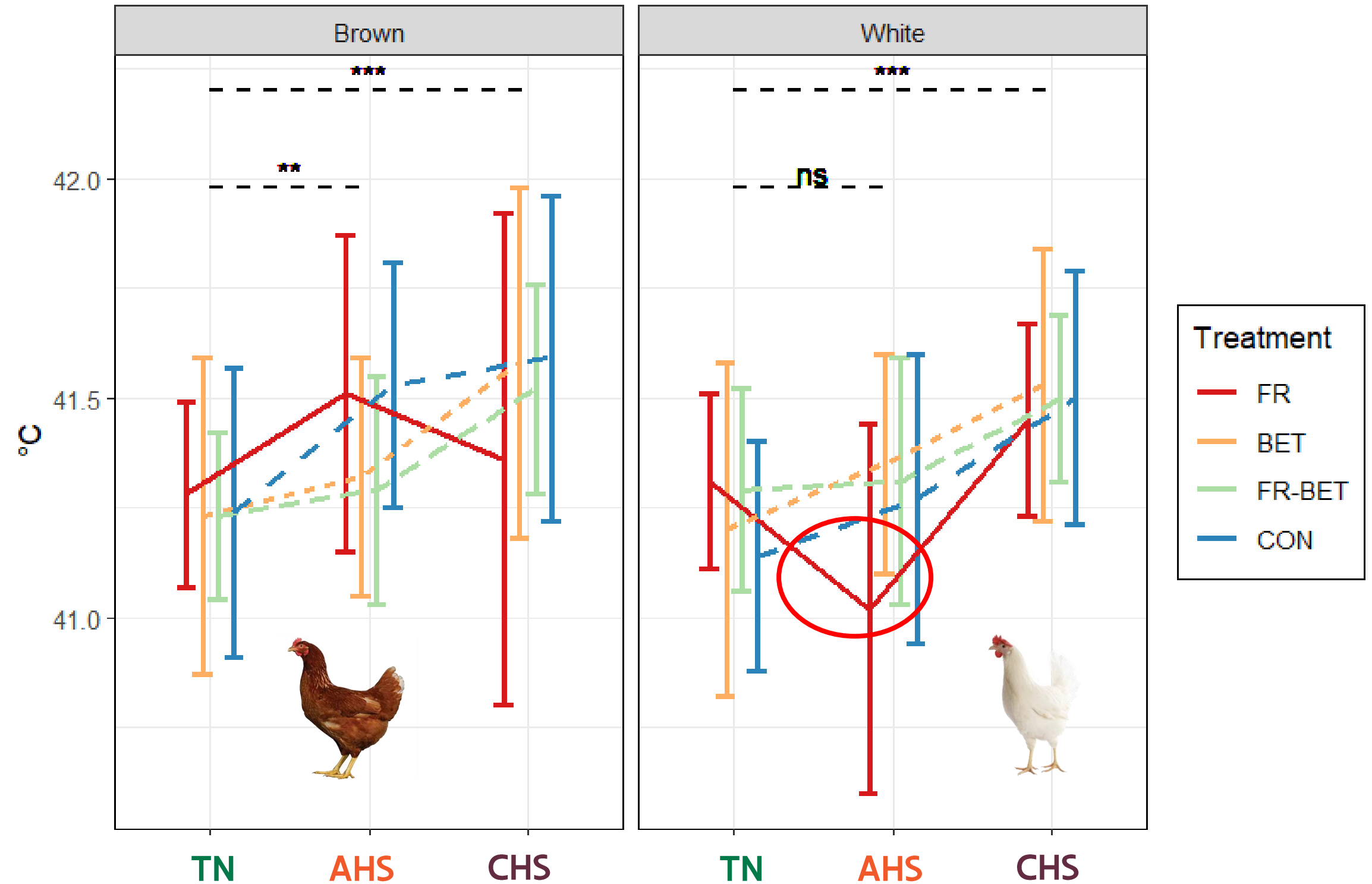
Lichaamstemperatuur (°C)



Body temperature


AHS: (L*T) $p=0.007$ - (L) $p<0.001$ - (T) $p=0.549$


CHS: (L*T) $p=0.832$ - (L) $p=0.935$ - (T) $p=0.105$




Prestaties


Acute hittestress:

 +2,62%

 +6,36%

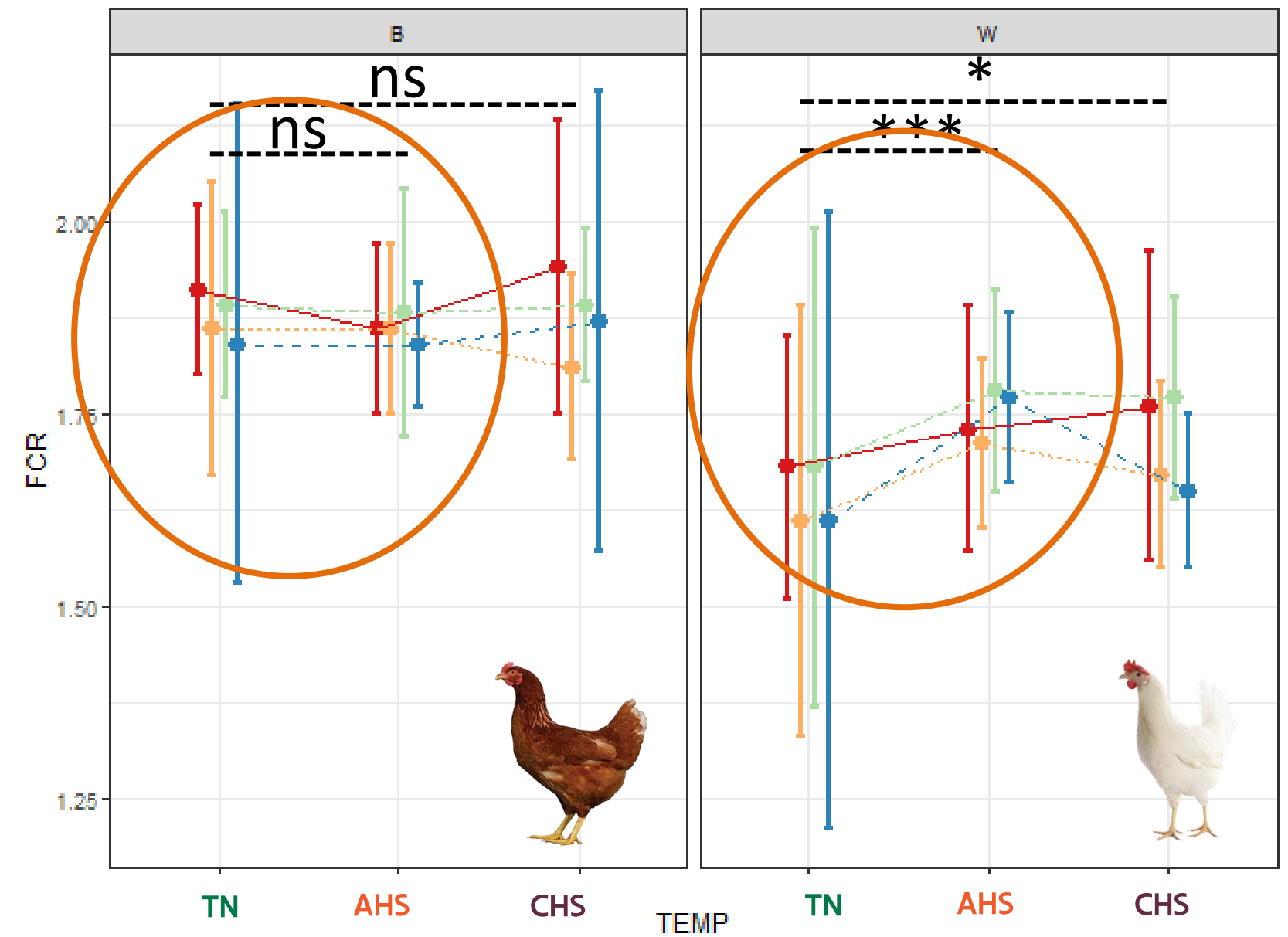
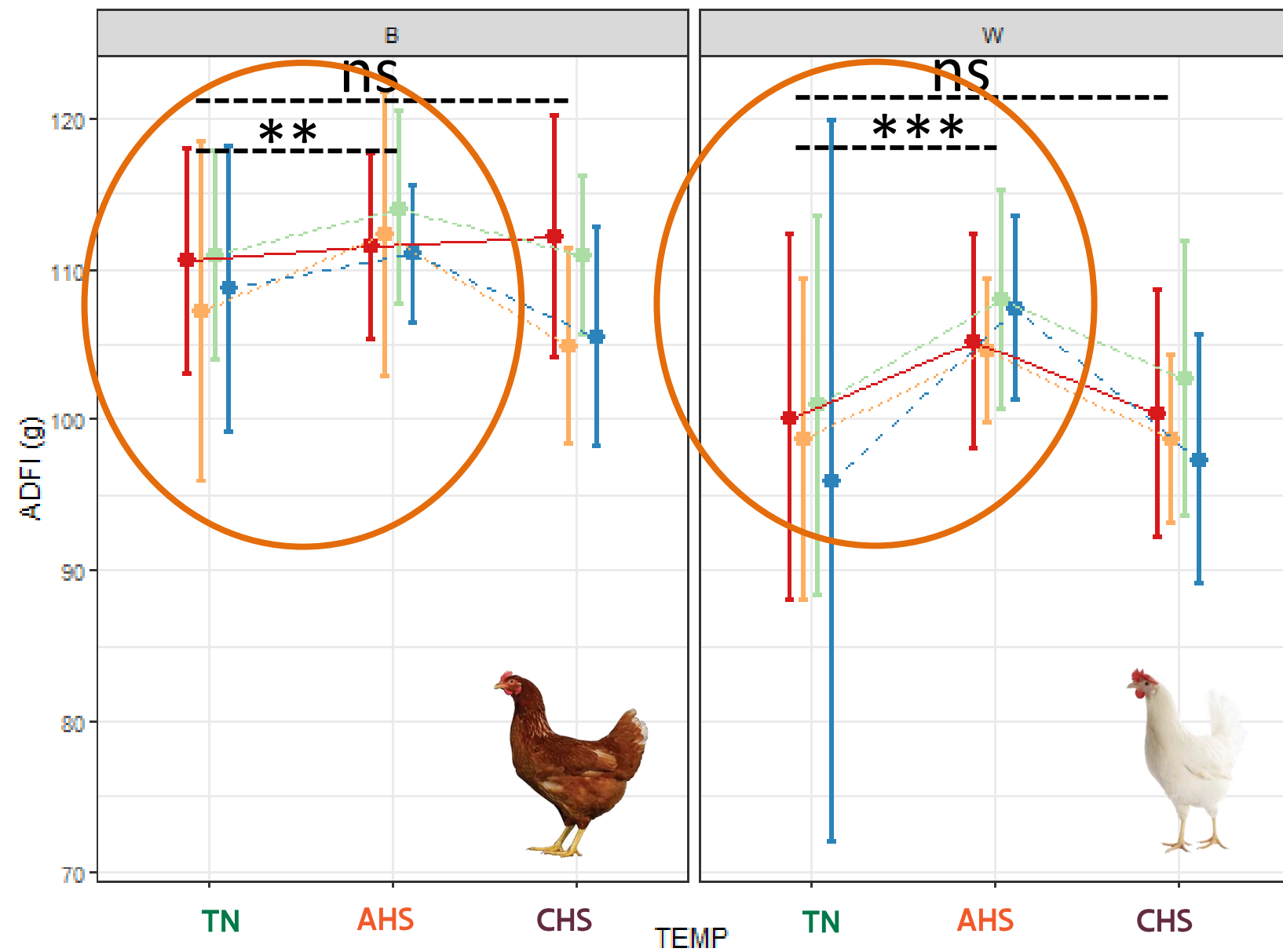
Acute hittestress:

 -0,83%

 +4,93%

Dagelijkse voederopname (g/hen/dag)

Voederconversie



Treatment — FR — BET — FR-BET — CON

Treatment — FR — BET — FR-BET — CON



Prestaties

Chronische hittestress:

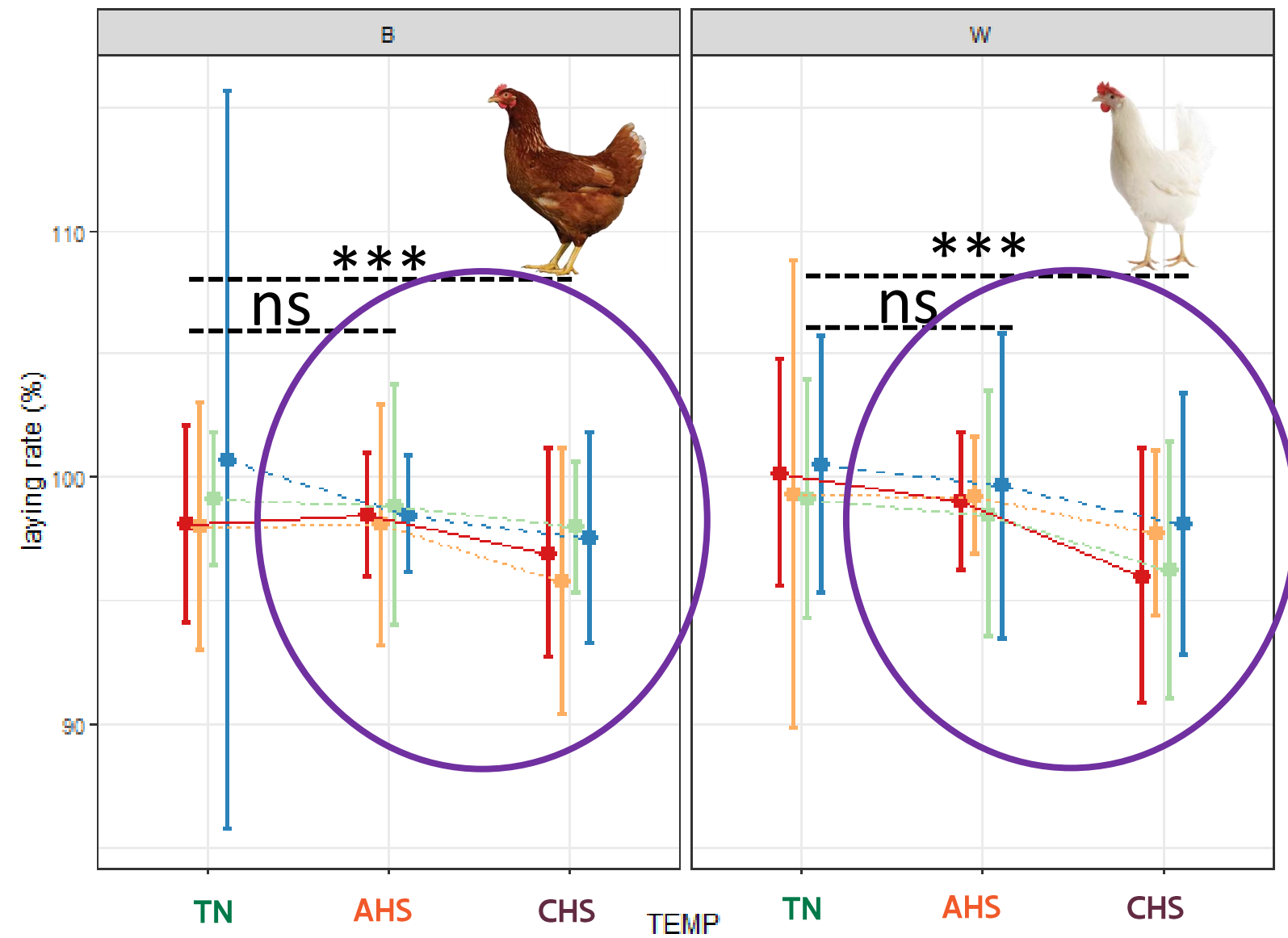


-1,94%



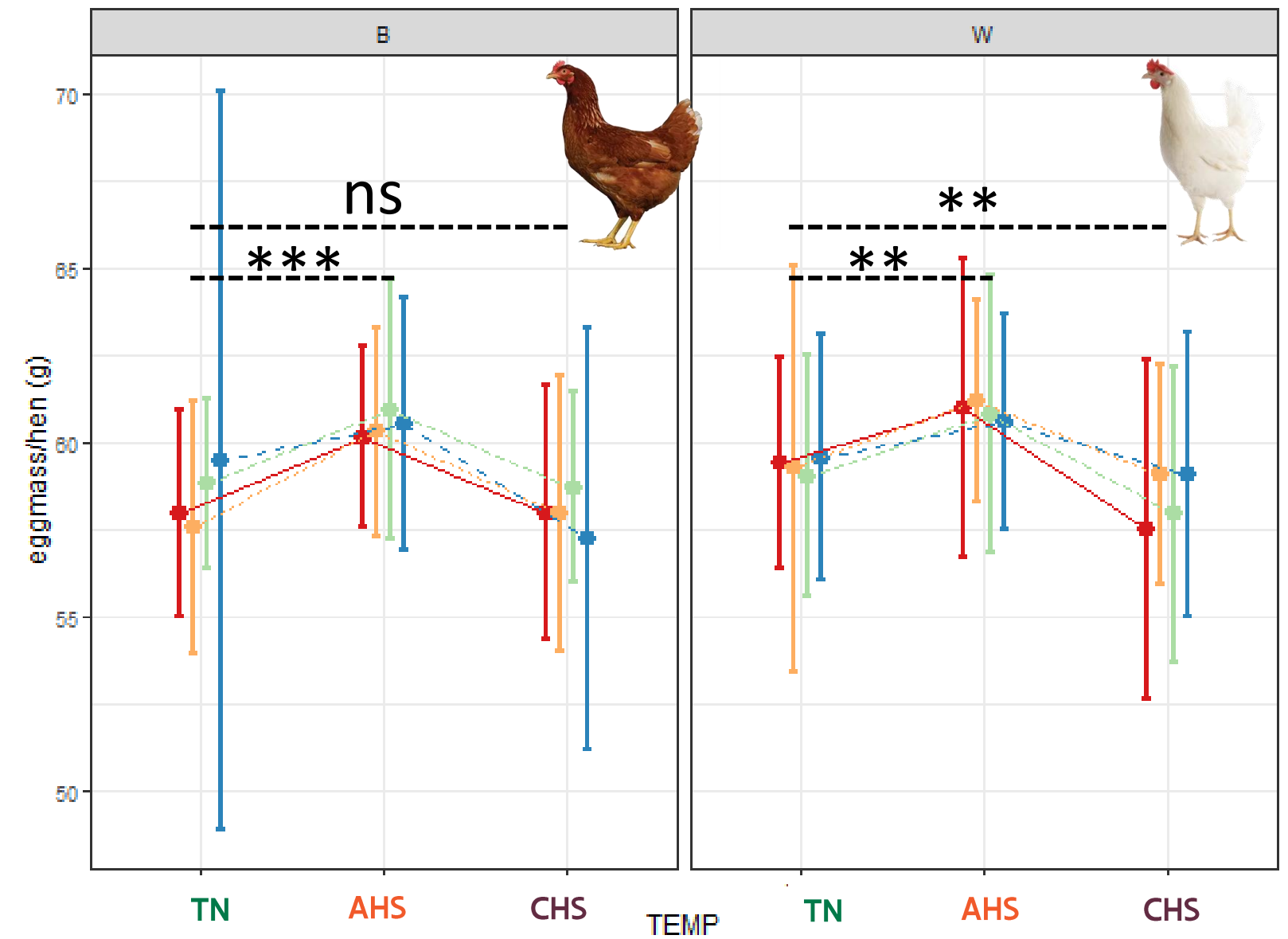
-2,78%

Legpercentage (%)



Treatment — FR — BET — FR-BET — CON

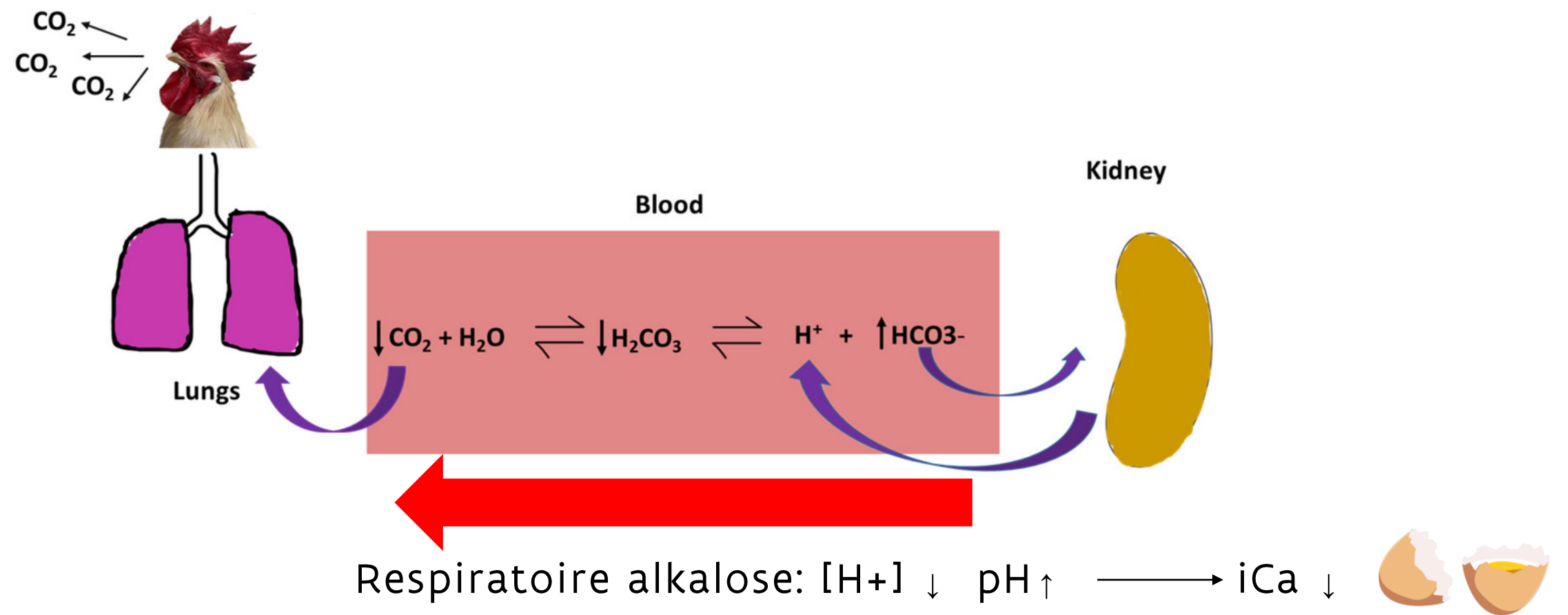
Ei massa (g/hen/dag)



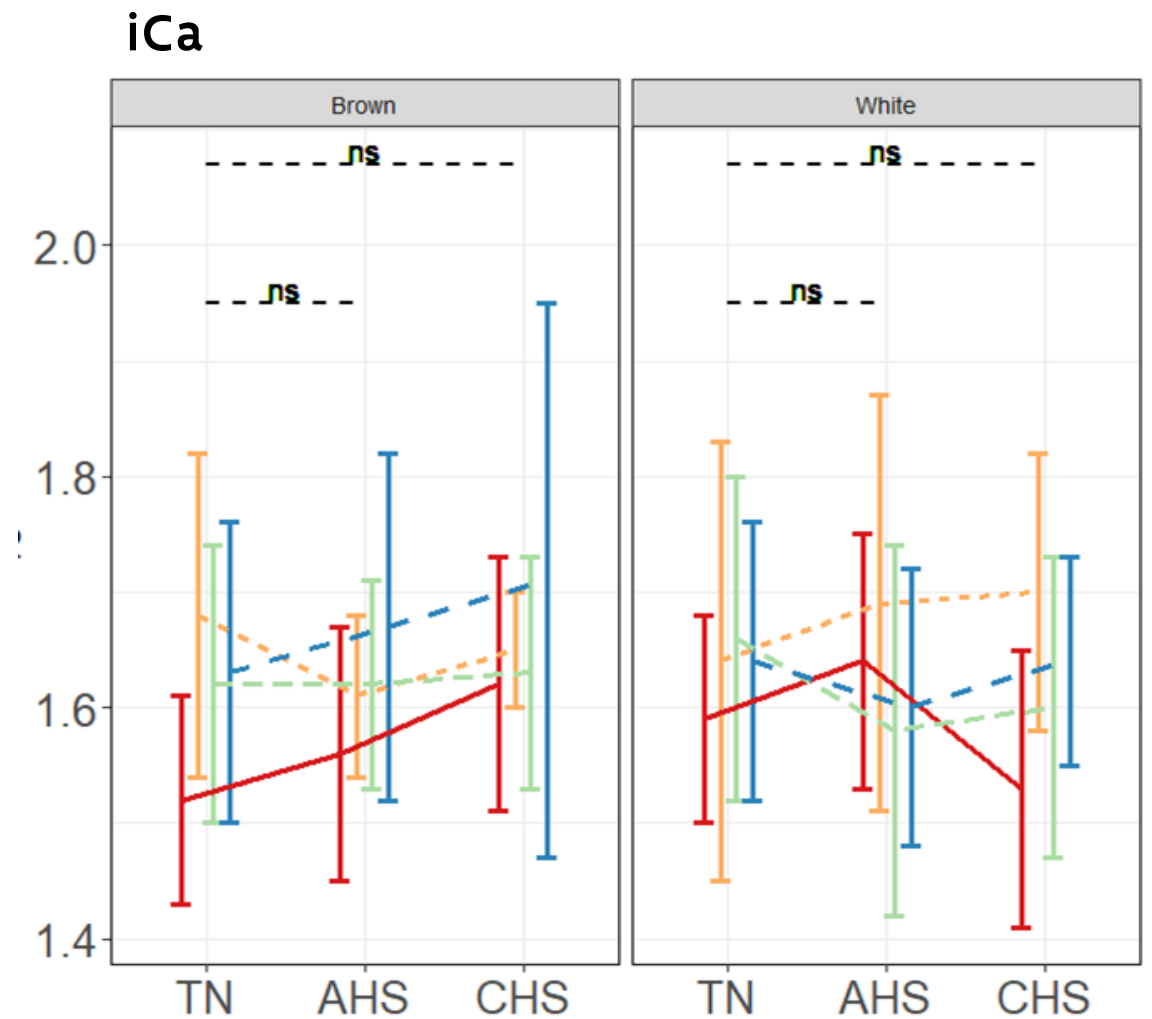
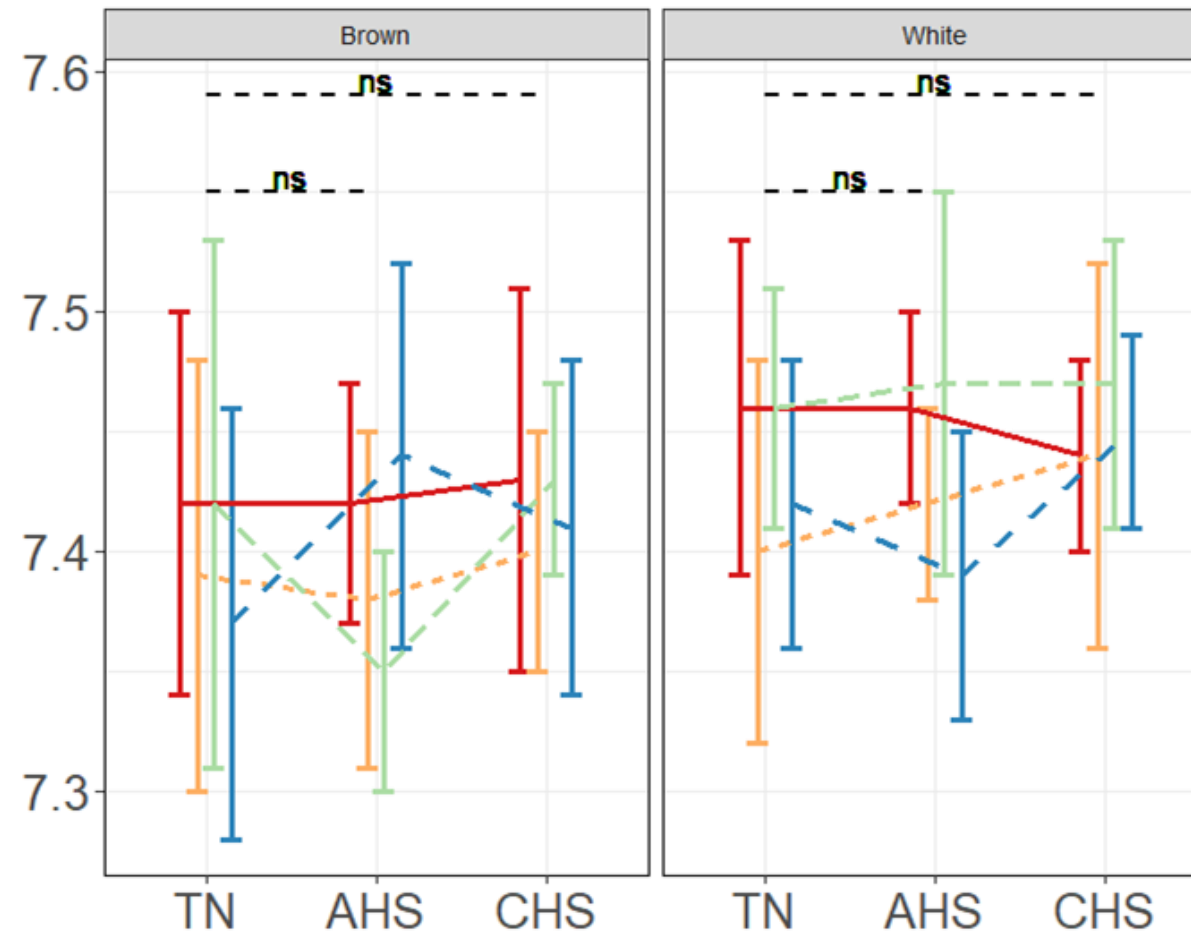
Treatment — FR — BET — FR-BET — CON

Wat gebeurt er achter de schermen?

Effecten in bloed



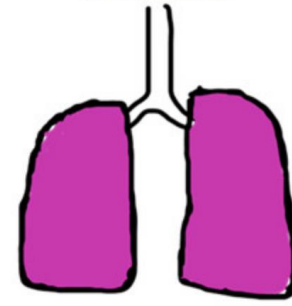
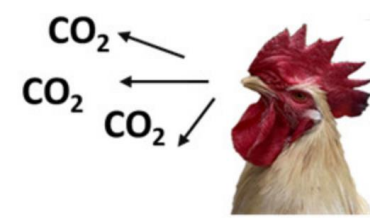
pH
 AHS: (B*T) p=0.039 - (B) p=0.829 - (T) p=0.037
 CHS: (B*T) p=0.997 - (B) p=0.777 - (T) p=0.280



Treatment — FR — BET — FR-BET — CON

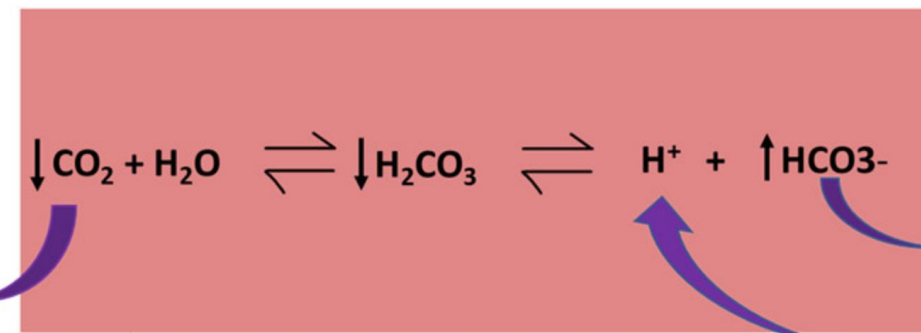
Wat gebeurt er achter de schermen?

Effecten in bloed



Lungs

Blood



Kidney



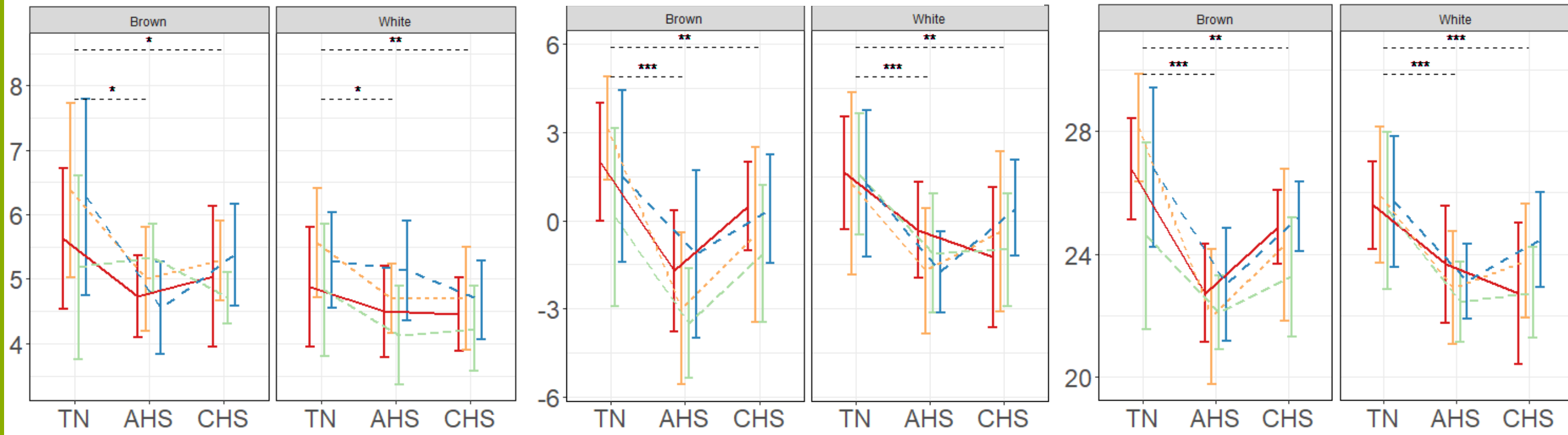
Respiratoire alkalose: $[\text{H}^+] \downarrow$ $\text{pH} \uparrow$ \longrightarrow $\text{iCa} \downarrow$



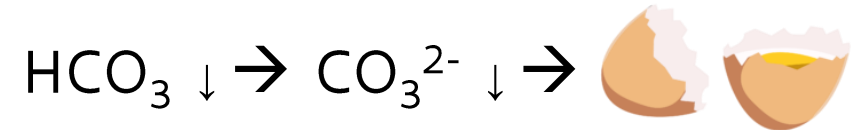
Base excess

pCO2

HCO3



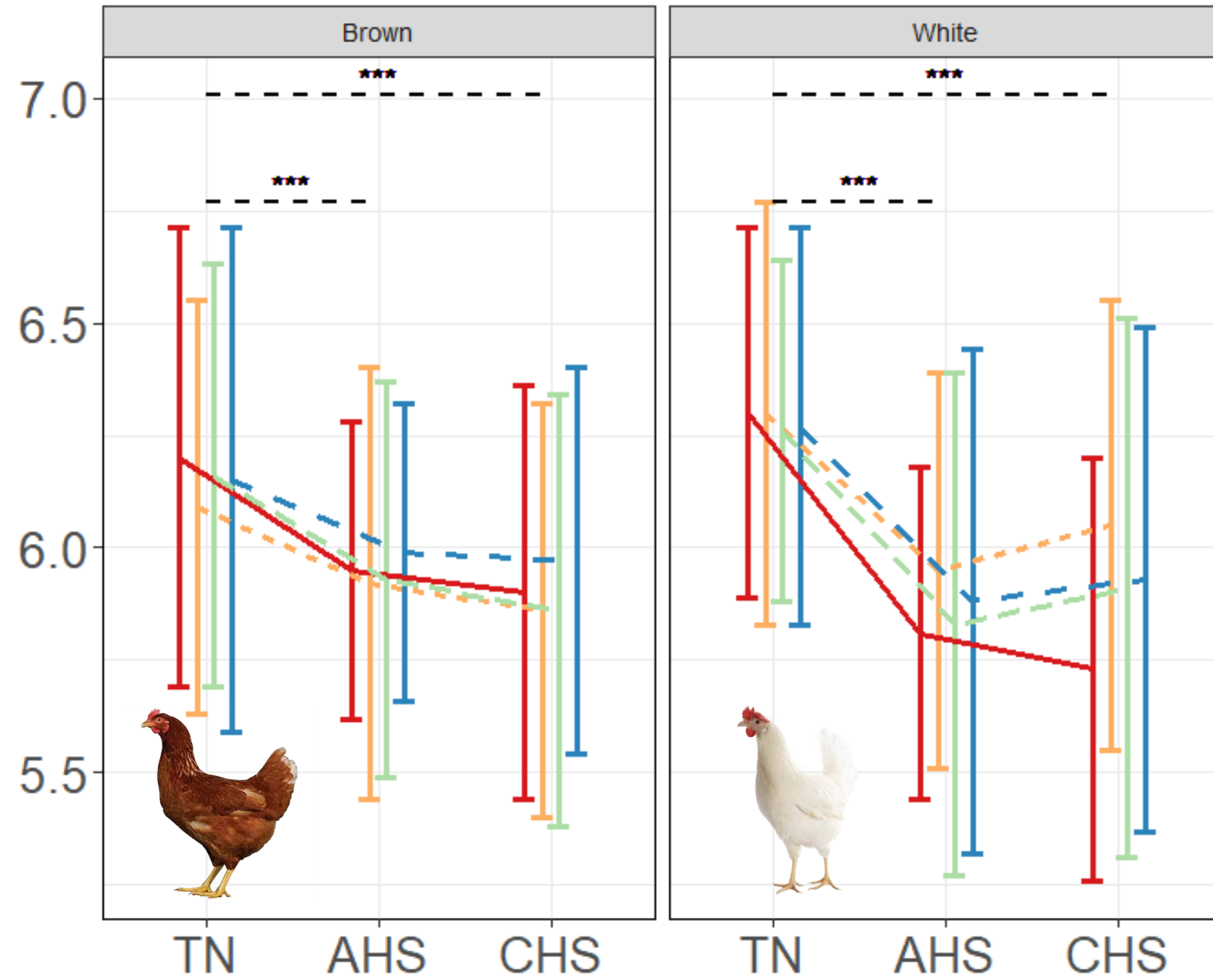
Treatment — FR — BET — FR-BET — CON



Eikwaliteit

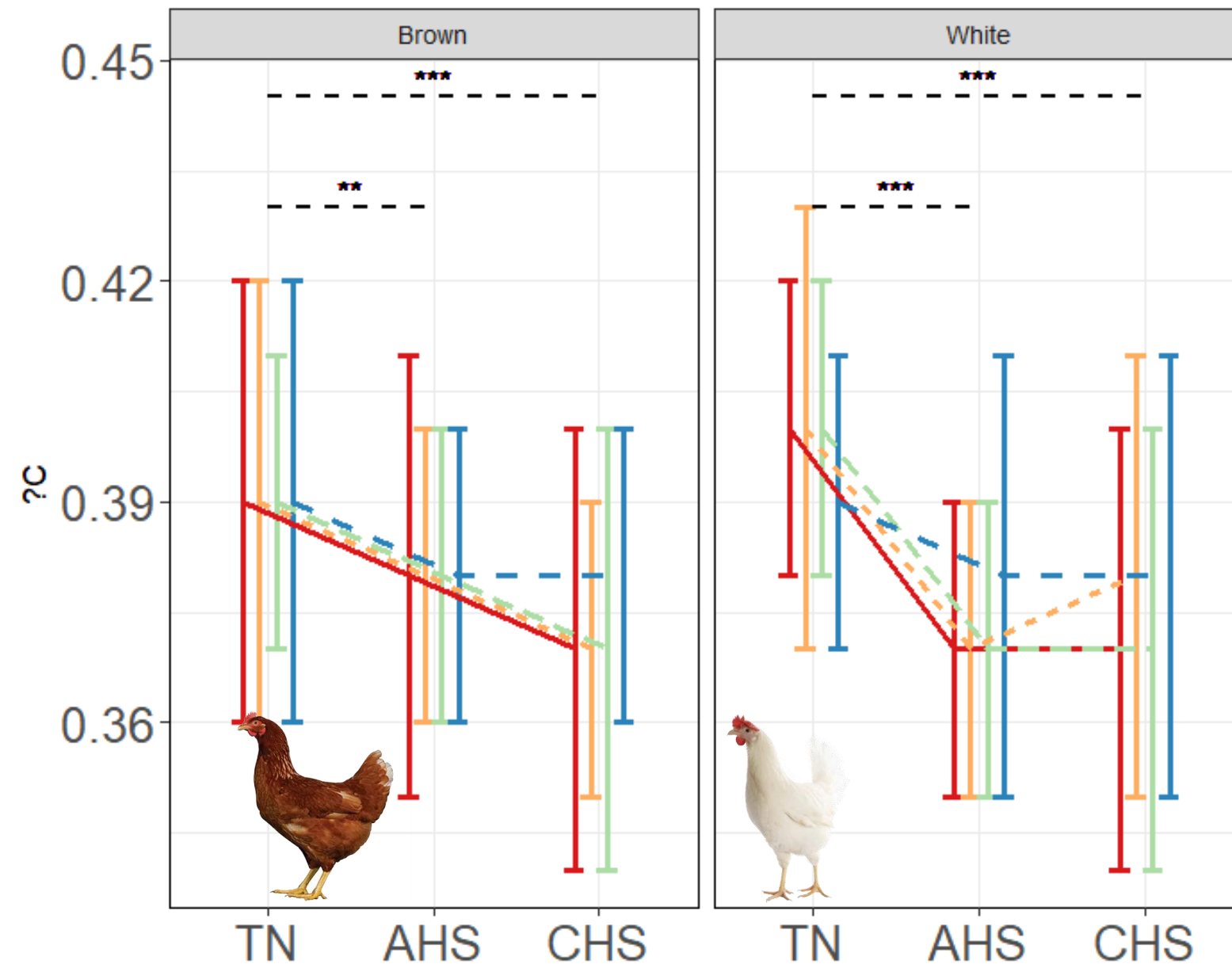
Schaalgewicht (g)

AHS: (B*T) p=0.990 - (B) p=<0.001 - (T) p=0.607



Schaaldikte (mm)

AHS: (B*T) p=0.882 - (B) p=0.003 - (T) p=0.403



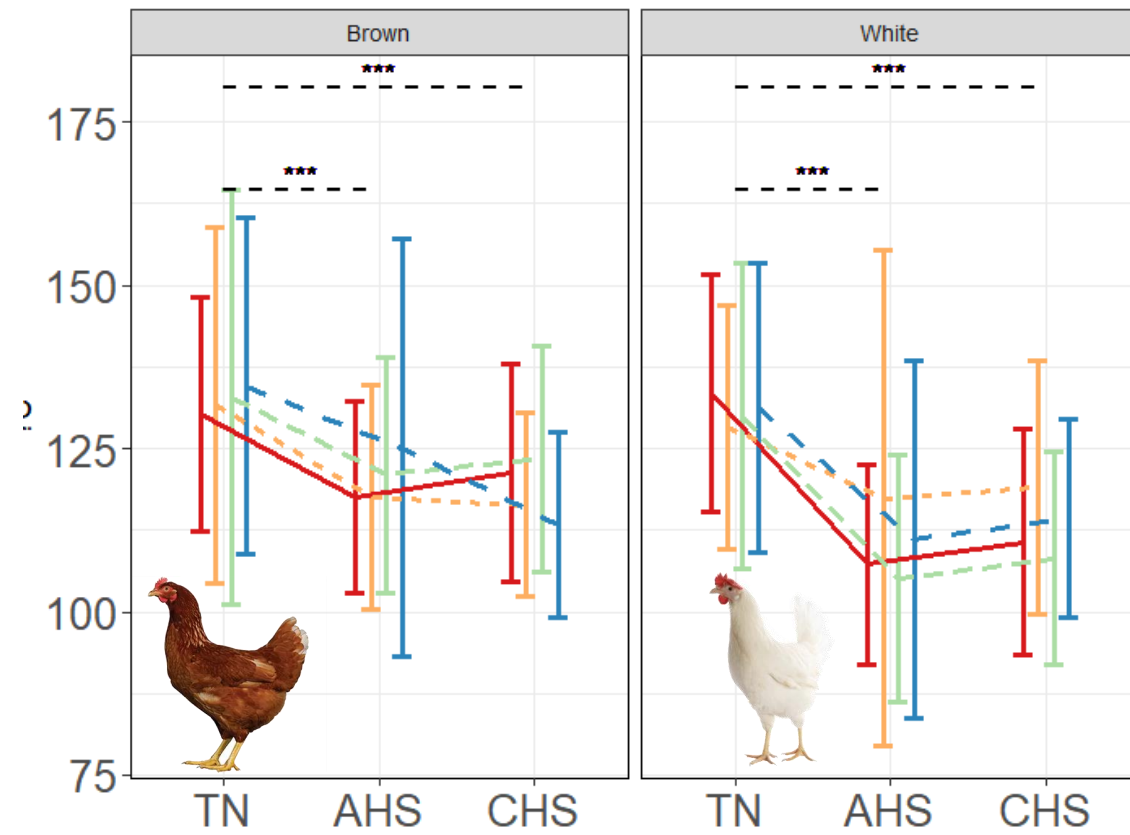
Treatment — FR — BET — FR-BET — CON

Eikwaliteit

Treatment — FR — BET — FR-BET — CON

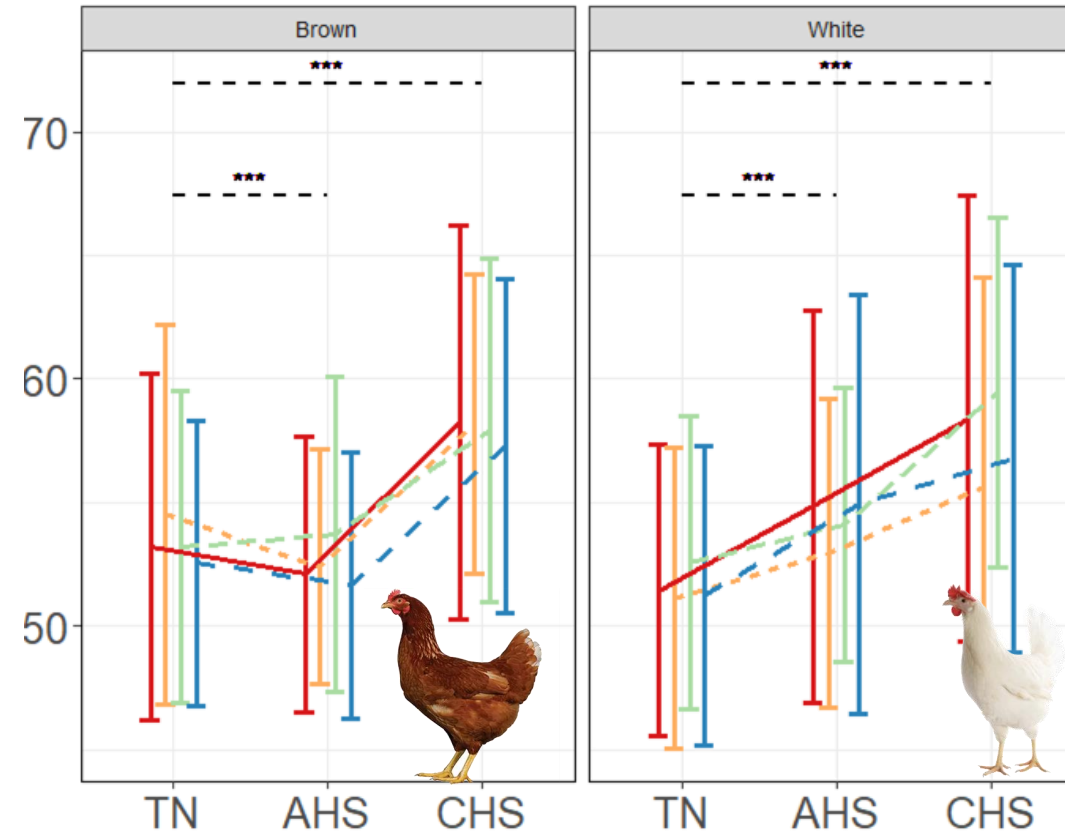
Dynamische stijfheid (Kdyn)

AHS: (B*T) $p=0.388$ - (B) $p=0.031$ - (T) $p=0.502$
 CHS: (B*T) $p=0.048$ - (B) $p=0.025$ - (T) $p=0.180$



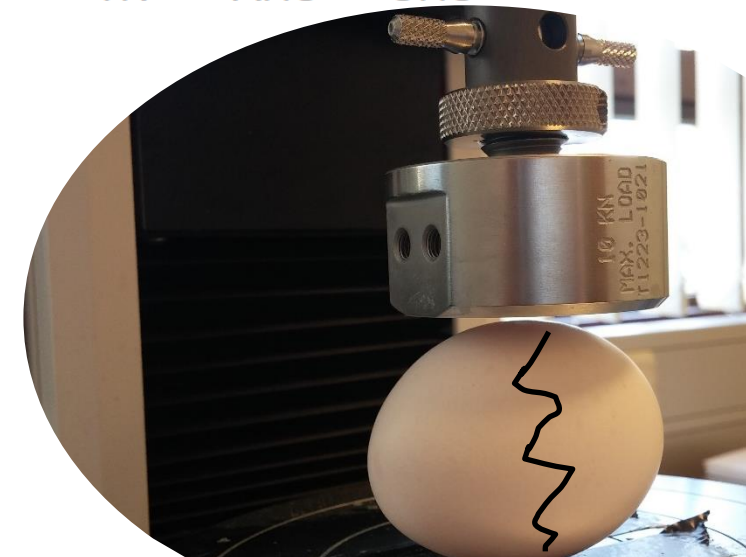
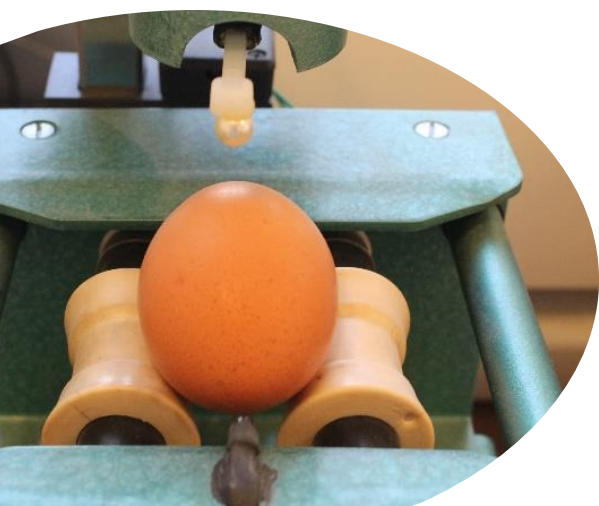
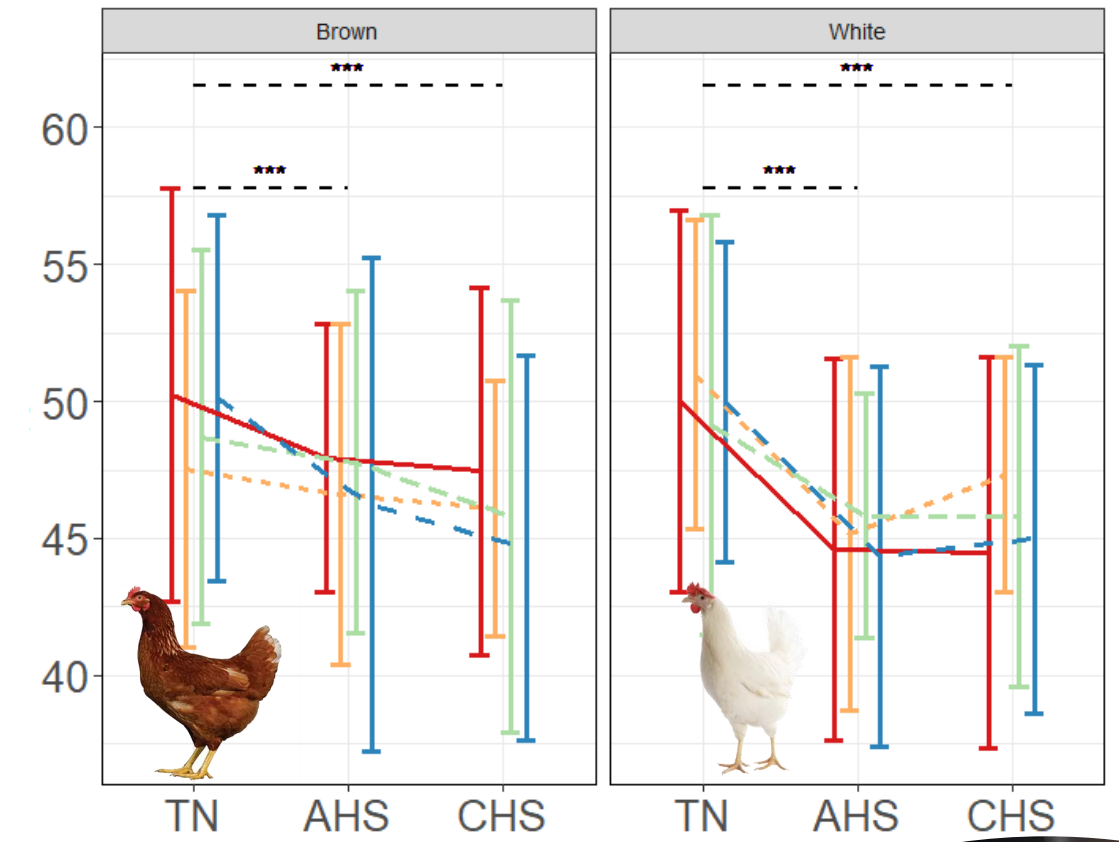
Doorbuiging (mm)

AHS: (B*T) $p=0.662$ - (B) $p=0.002$ - (T) $p=0.751$

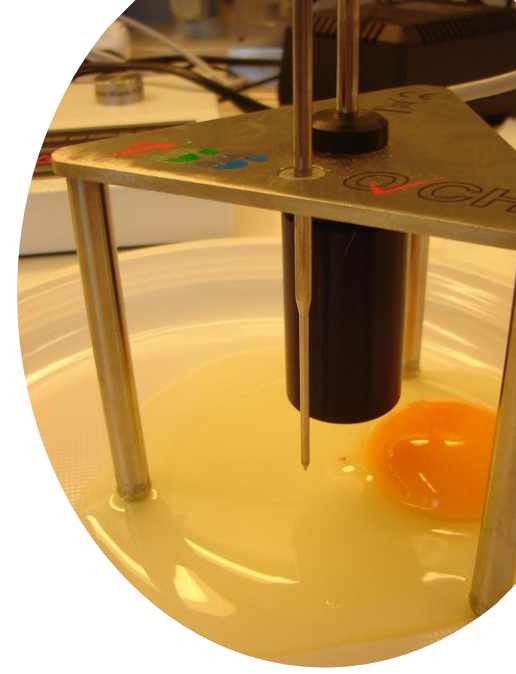


Breuksterkte (N)

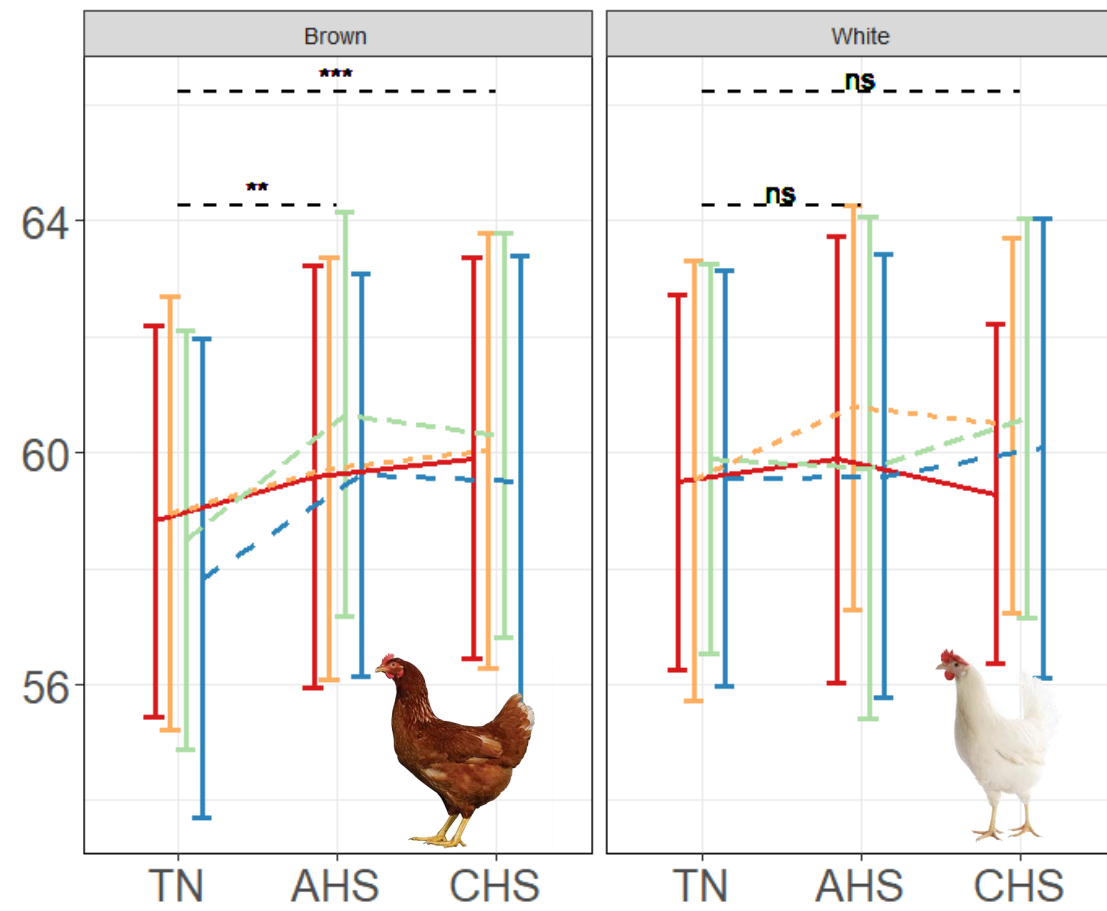
AHS: (B*T) $p=0.678$ - (B) $p=0.007$ - (T) $p=0.361$



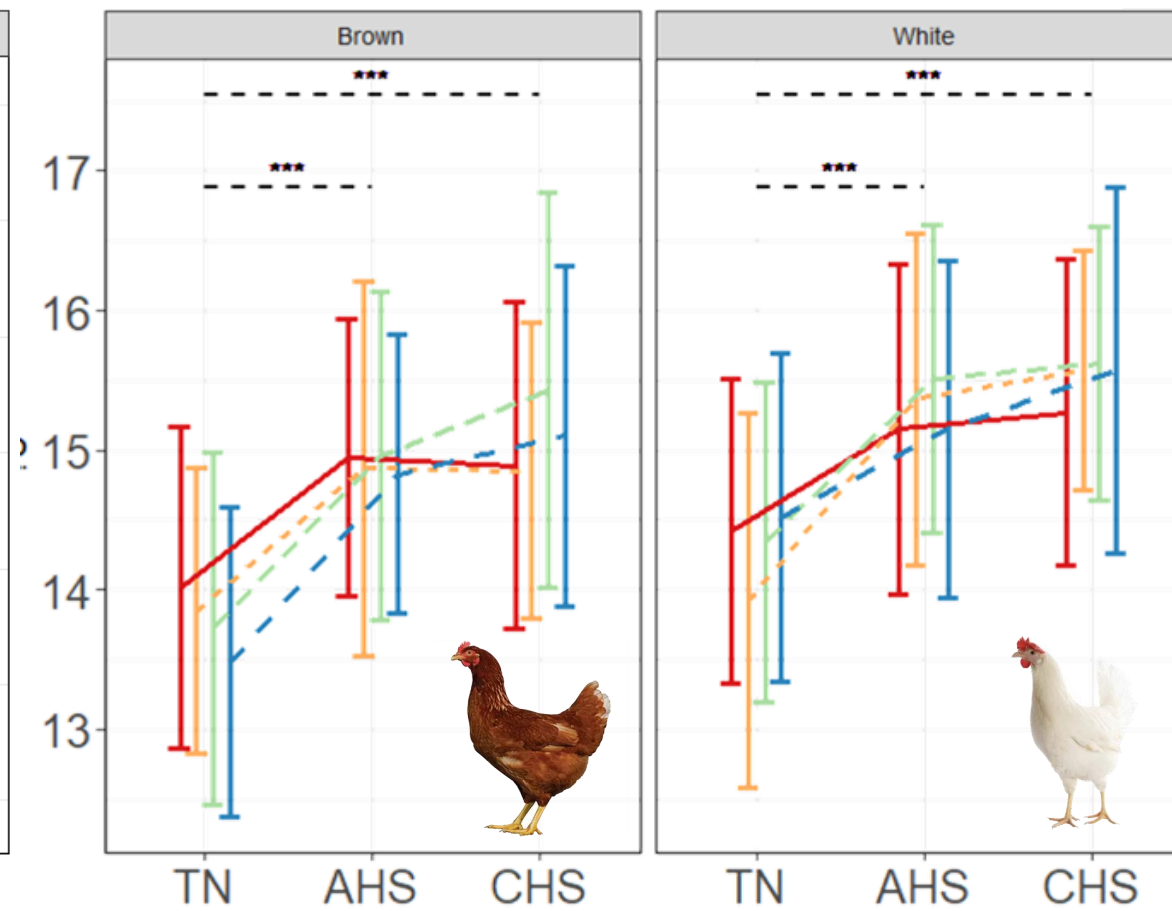
Eikwaliteit



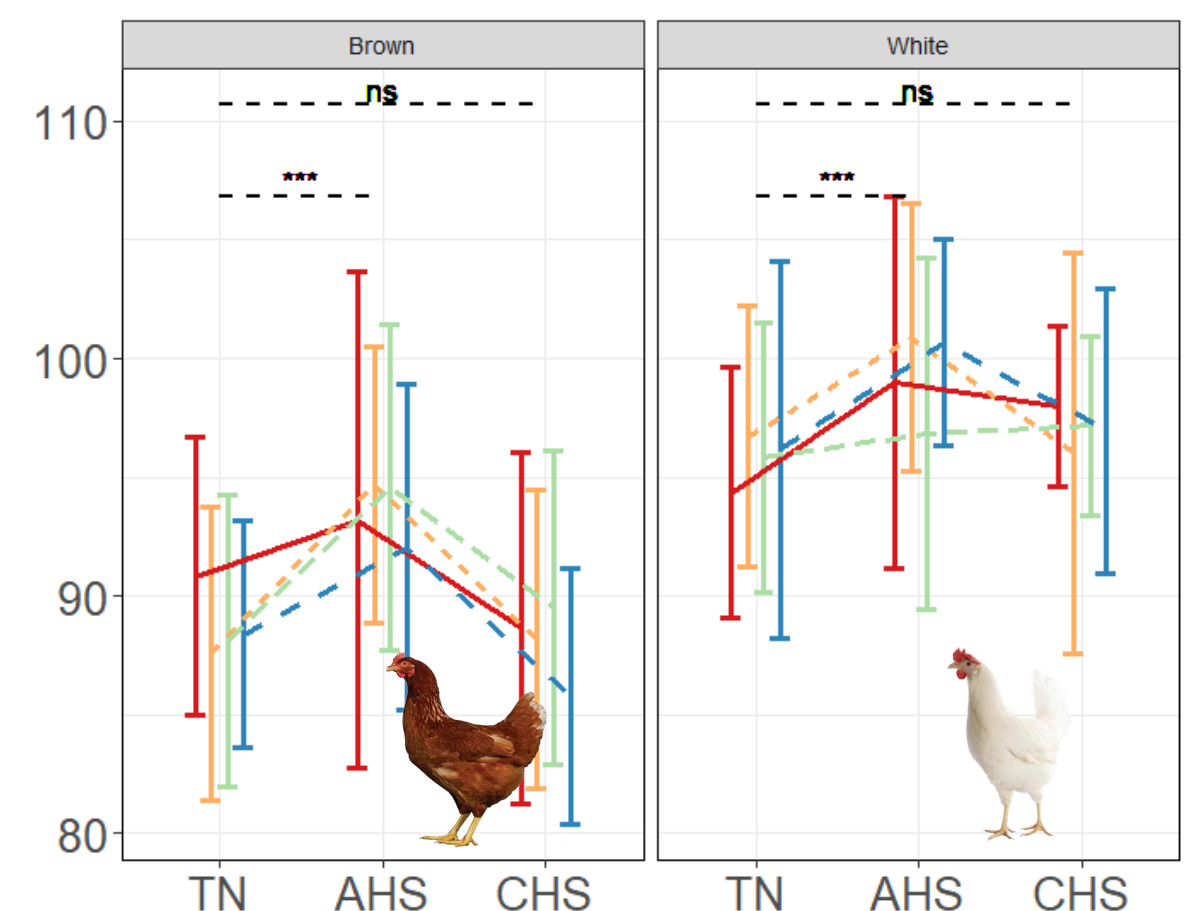
Eigewicht (g)



Dooiergewicht (g)



Haugh unit





Conclusie

Hittestress protocol werkt:

- Eikwaliteit minder
- Bloedwaarden beïnvloed
- Lager legpercentage

Voornamelijk raseffecten

- Acuut: wit eet meer
- Chronisch: wit legt minder
- Eishaalkwaliteit gedaald, erger bij witte
- Hoe? Genetisch, thermotolerantie,...

Behandelingen

- Weinig effecten
- Hittestress te mild?
- Toepassing: concentratie, timing

MEER WETEN?





Poultry Science

Volume 103, Issue 10, October 2024, 104104



Betaine and feed restriction as potential mitigation strategies against heat stress in two strains of laying hens

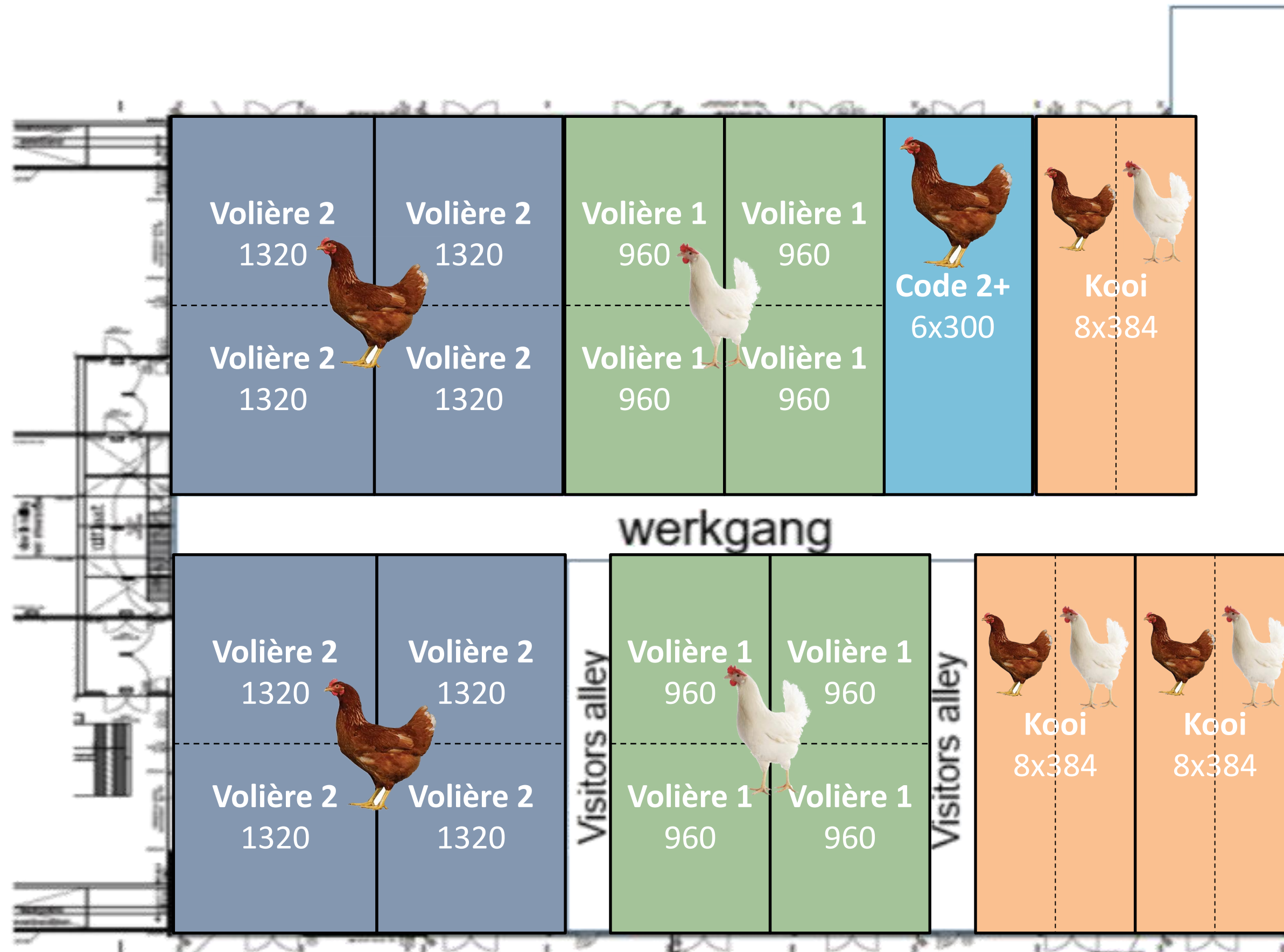
Renée De Baets * †  , Kobe Buyse * ‡, Gunther Antonissen †, Evelyne Delezie *



LEGHENNENPROEF

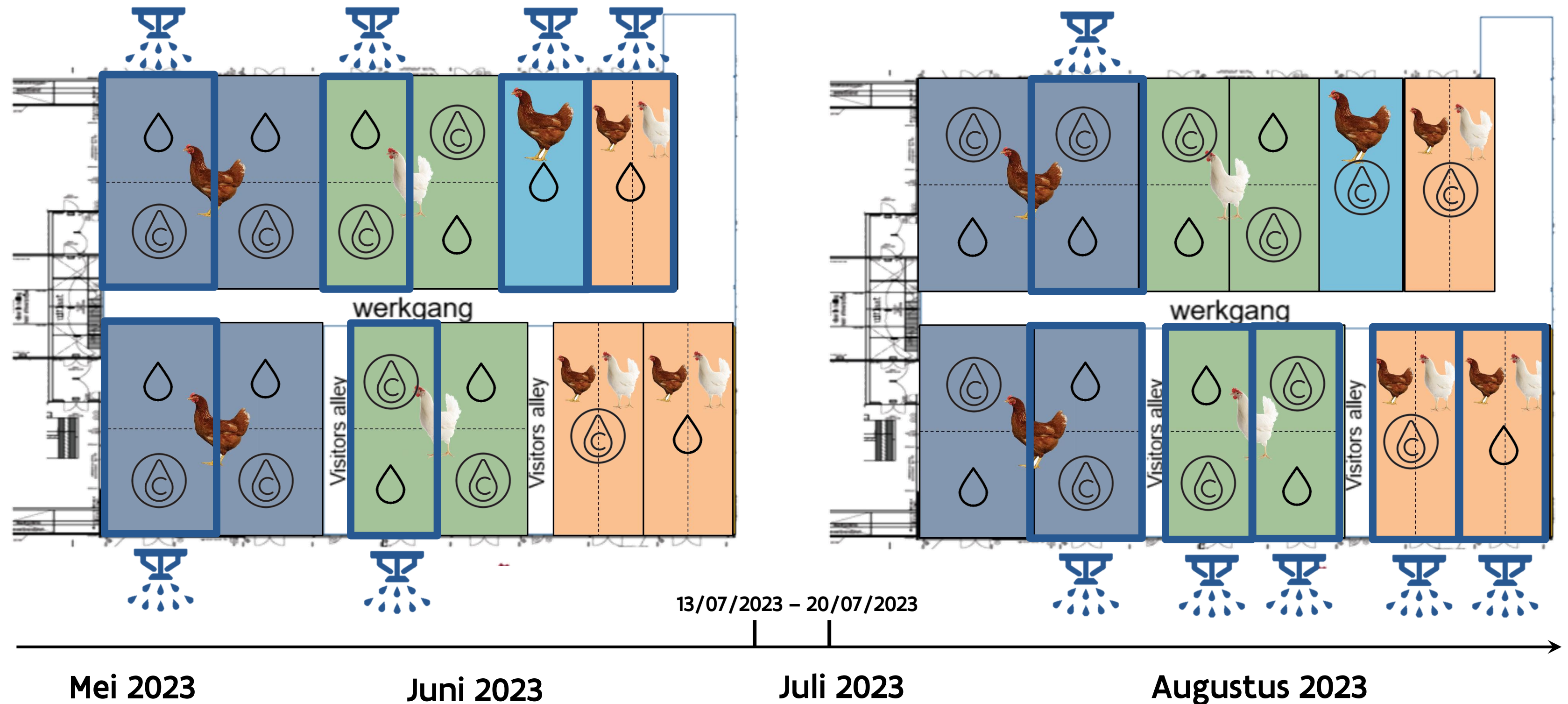
Effect van verneveling en vitamine C tijdens natuurlijke hittestress bij twee rassen leghennen

PROEFOPZET



PROEFOPZET

- Inschakeltemperatuur verneveling: 24 °C
- Wateradditief: vitamine C vanaf 25 °C (buiten)



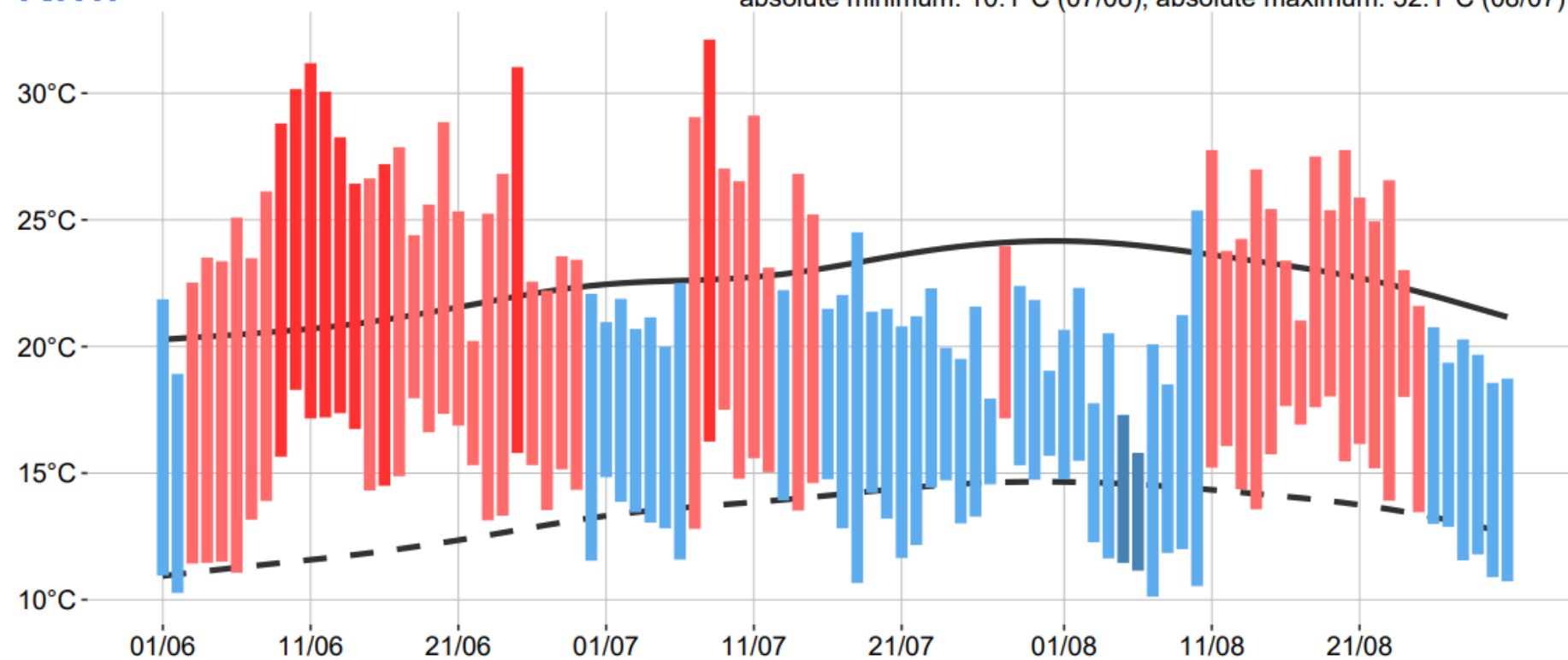
KLIMAAT

ZOMER 2023

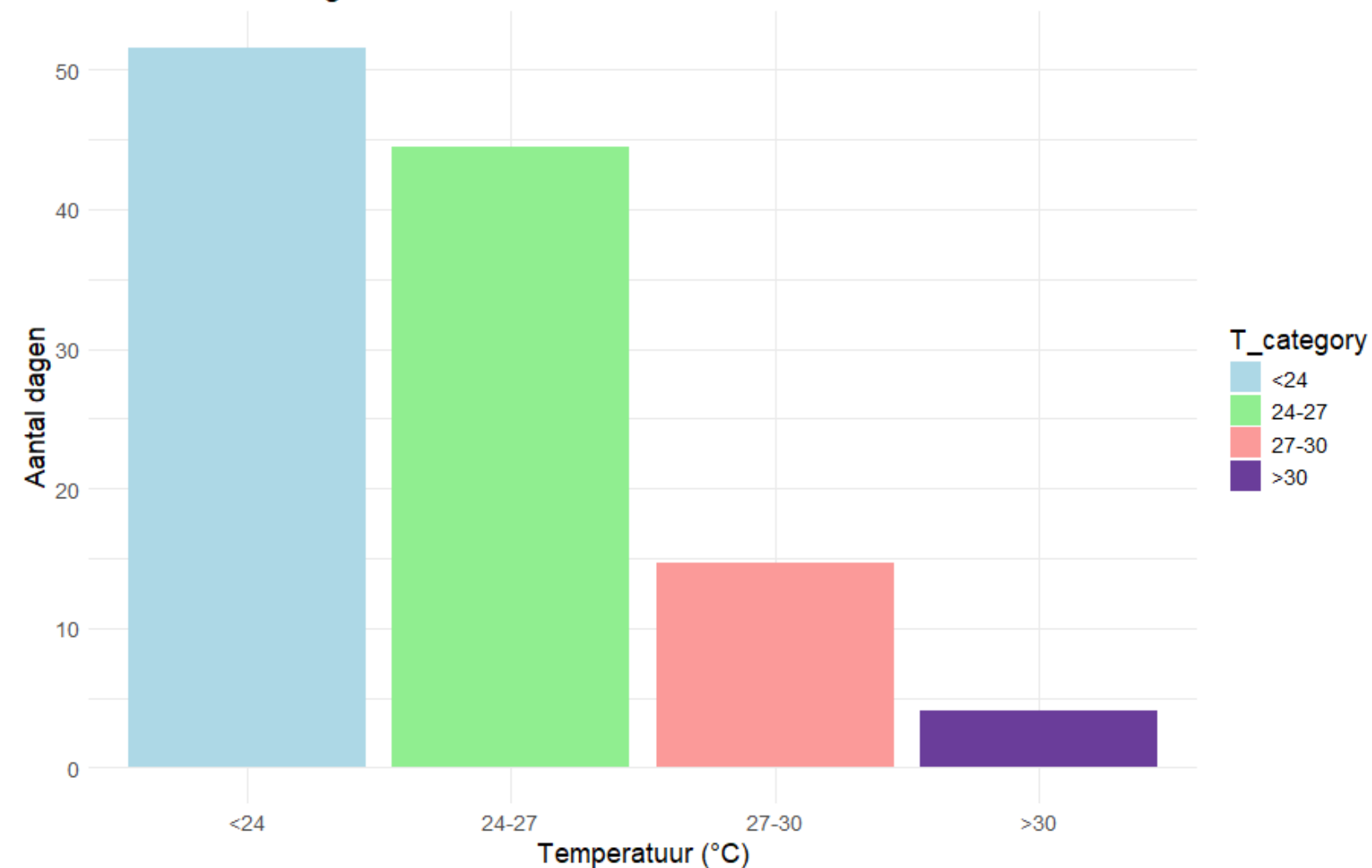


Dagelijkse temperatuurverschillen, Ukkel, zomer 2023

seizoengemiddelde temperatuur: 18.9°C (normaal: 17.9°C)
absolute minimum: 10.1°C (07/08), absolute maximum: 32.1°C (08/07)



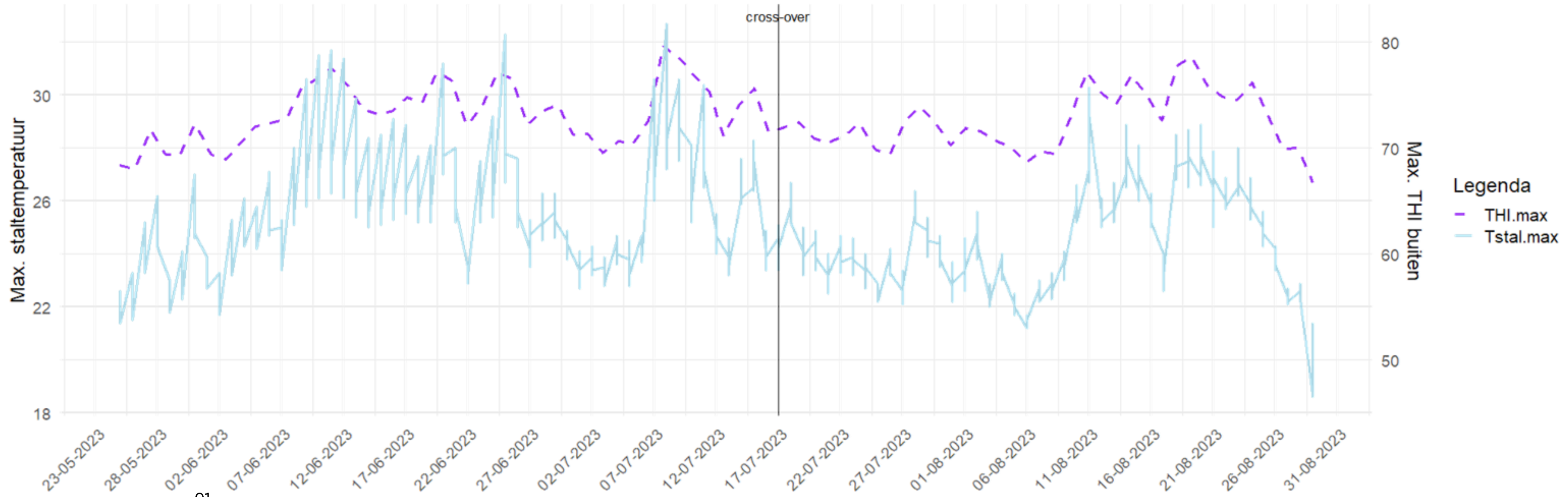
Aantal warme dagen



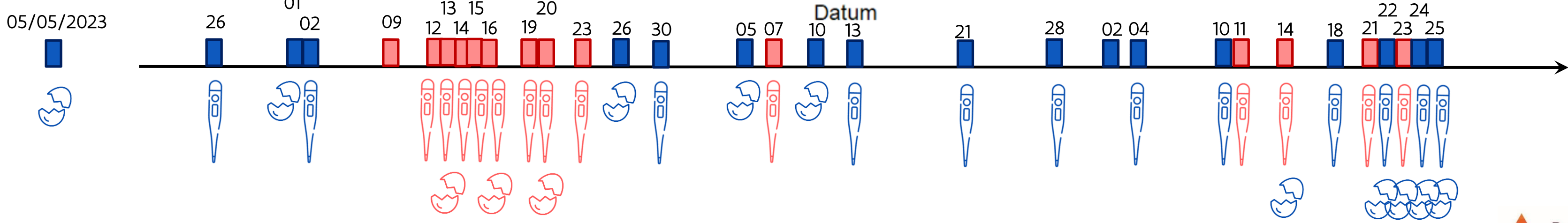
Leghennen

TIJDLIJN

Maximaal buitenklimaat per dag



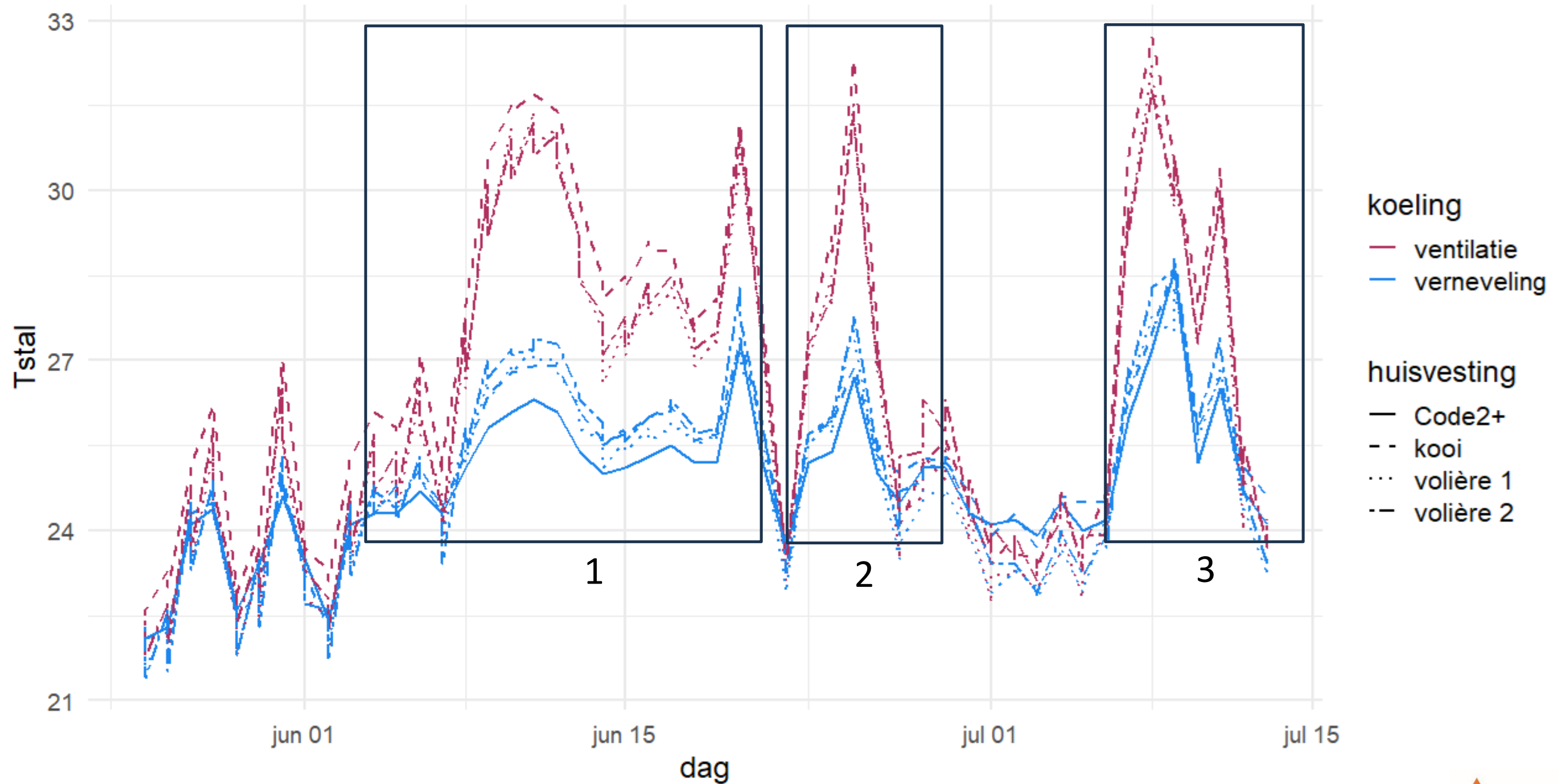
Legenda
 - THI.max
 - Tstal.max



Leghennen

25/05/2023 – 13/07/2023

Maximale staltemperatuur per dag

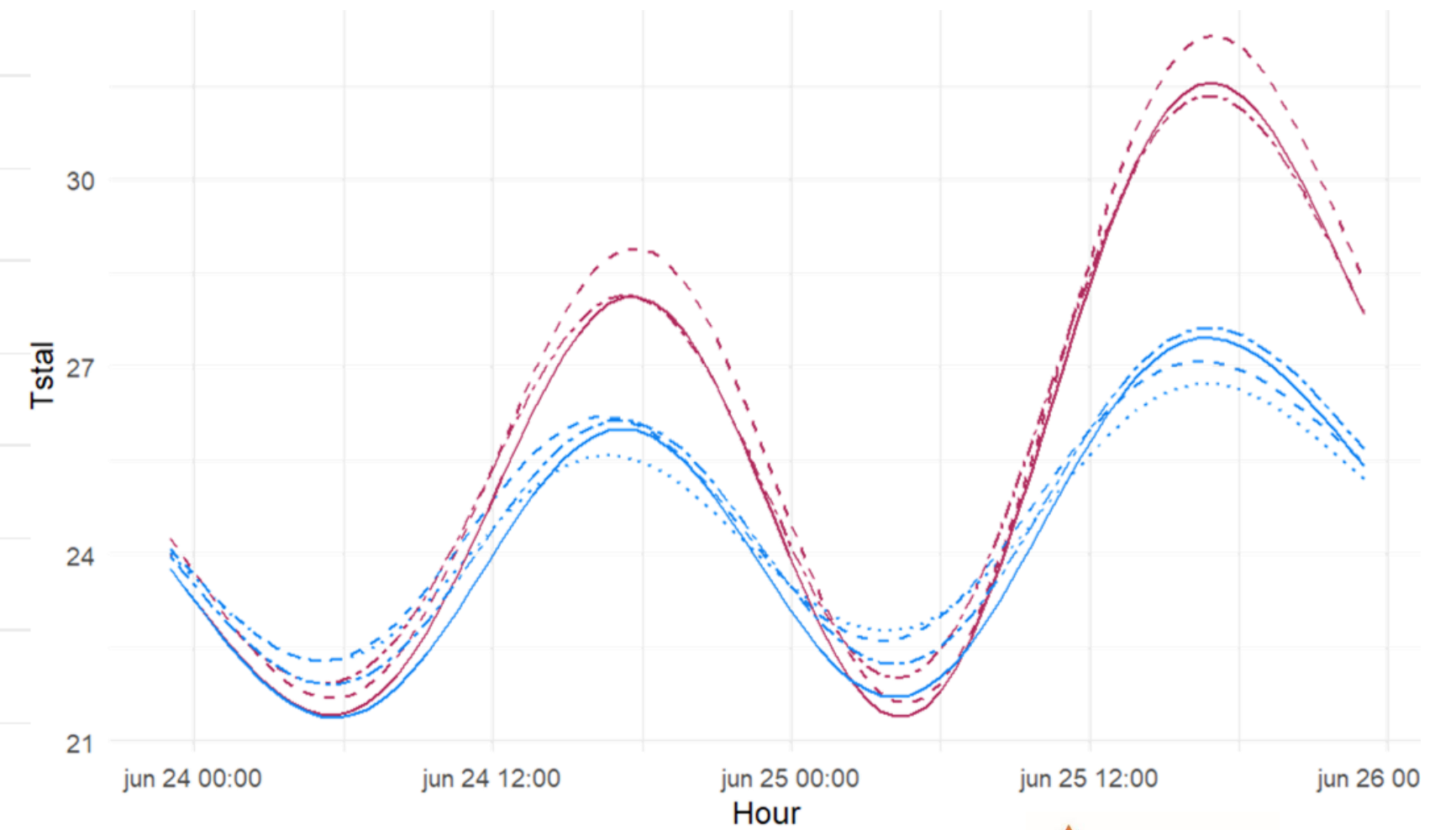
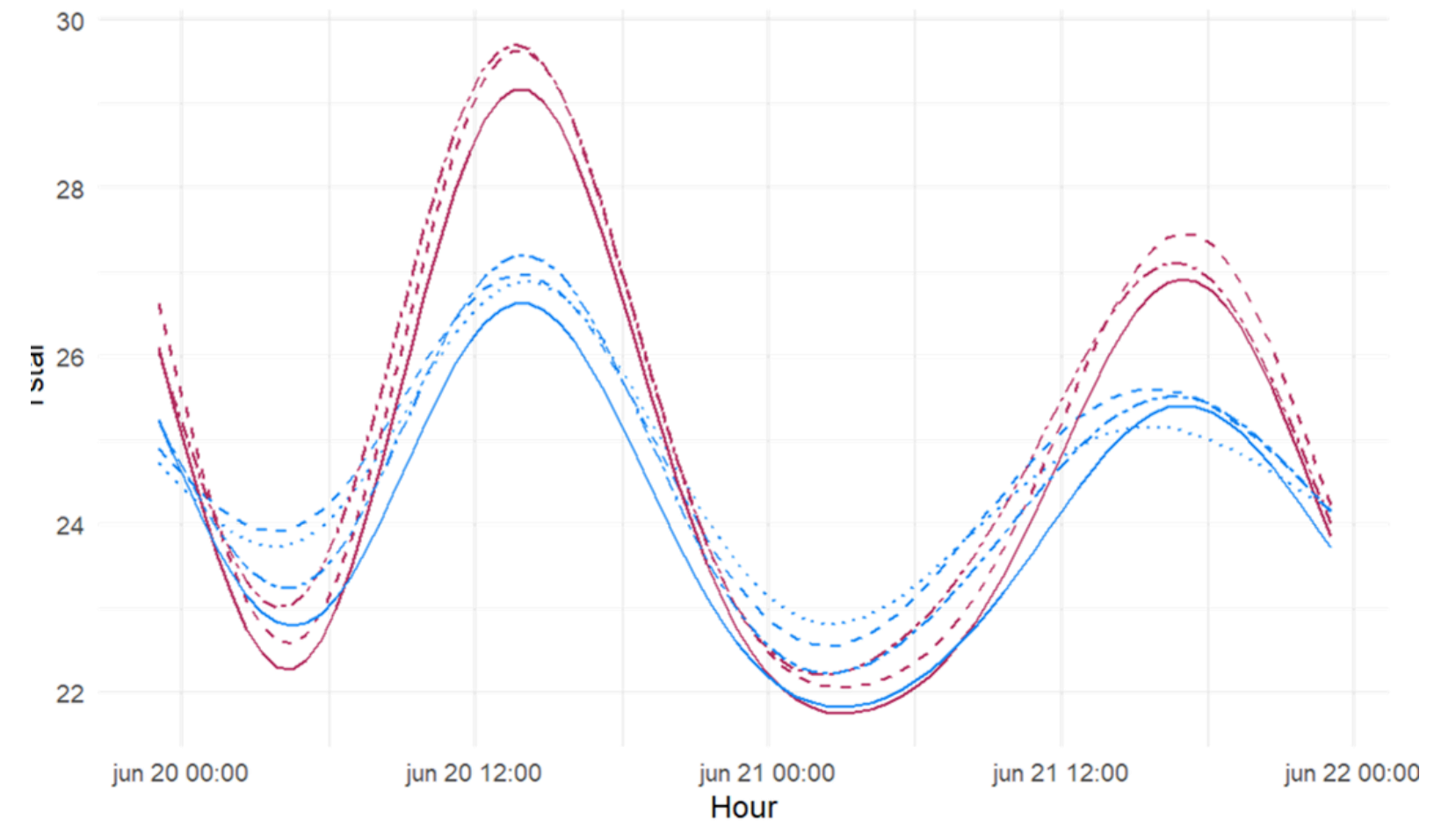
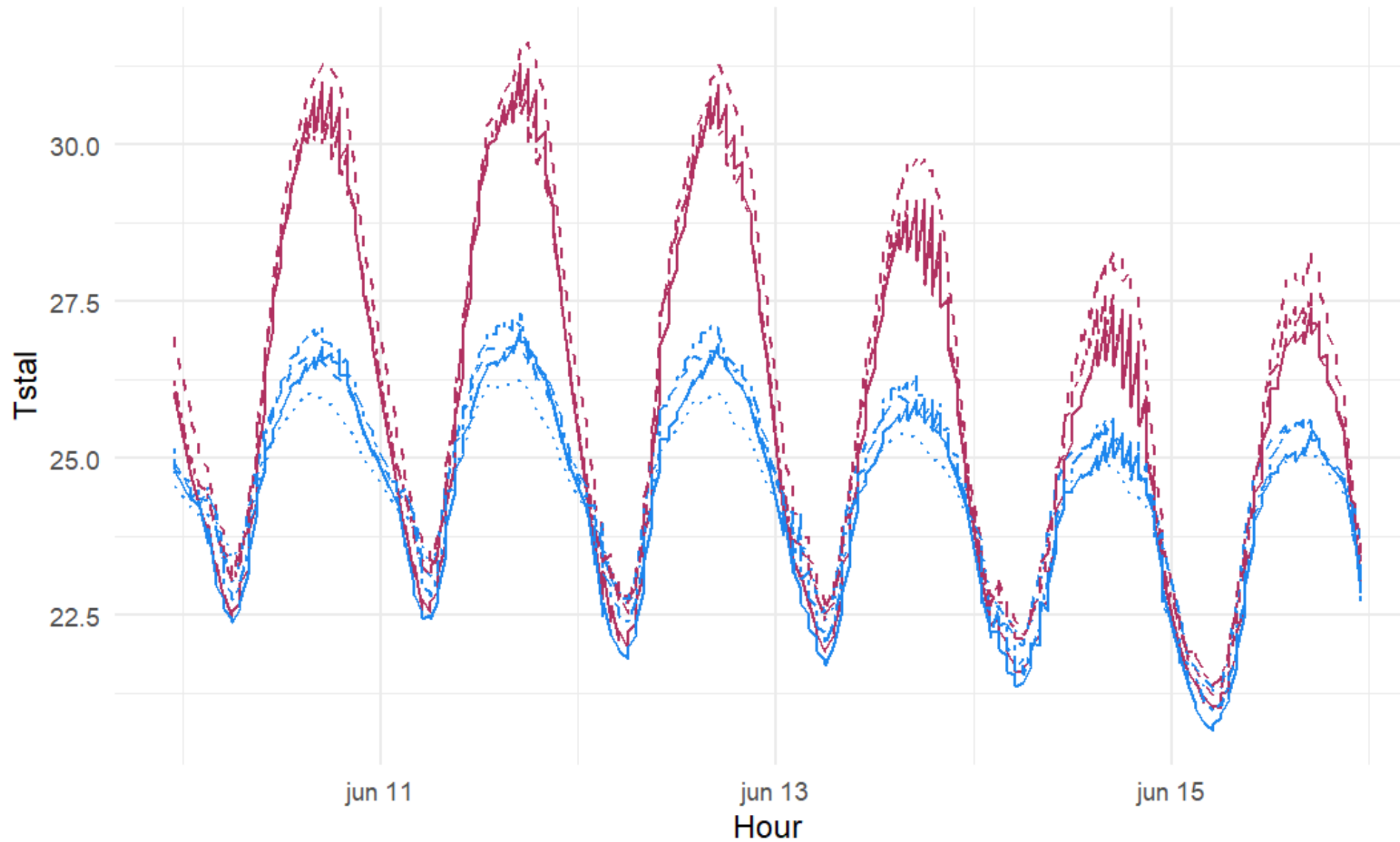


Leghennen

Warme dagen - staltemperatuur

- | koeling | huisvesting |
|---------------|---------------|
| — ventilatie | ... Code2+ |
| — verneveling | - - kooi |
| | — volière 1 |
| | - - volière 2 |

Staltemperatuur per uur



Leghennen

Warme dagen – RV & THI

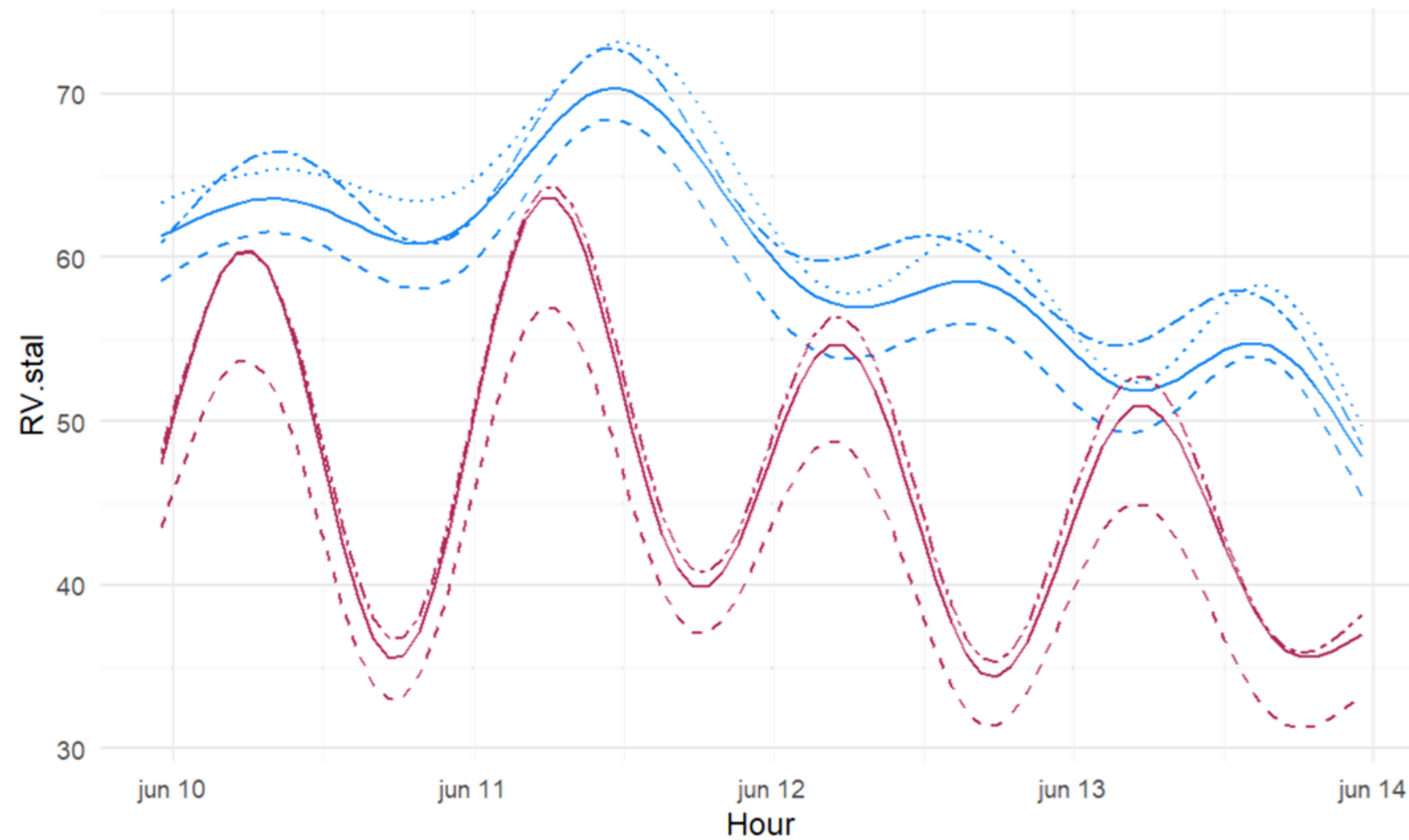
koeling

- ventilatie
- verneveling

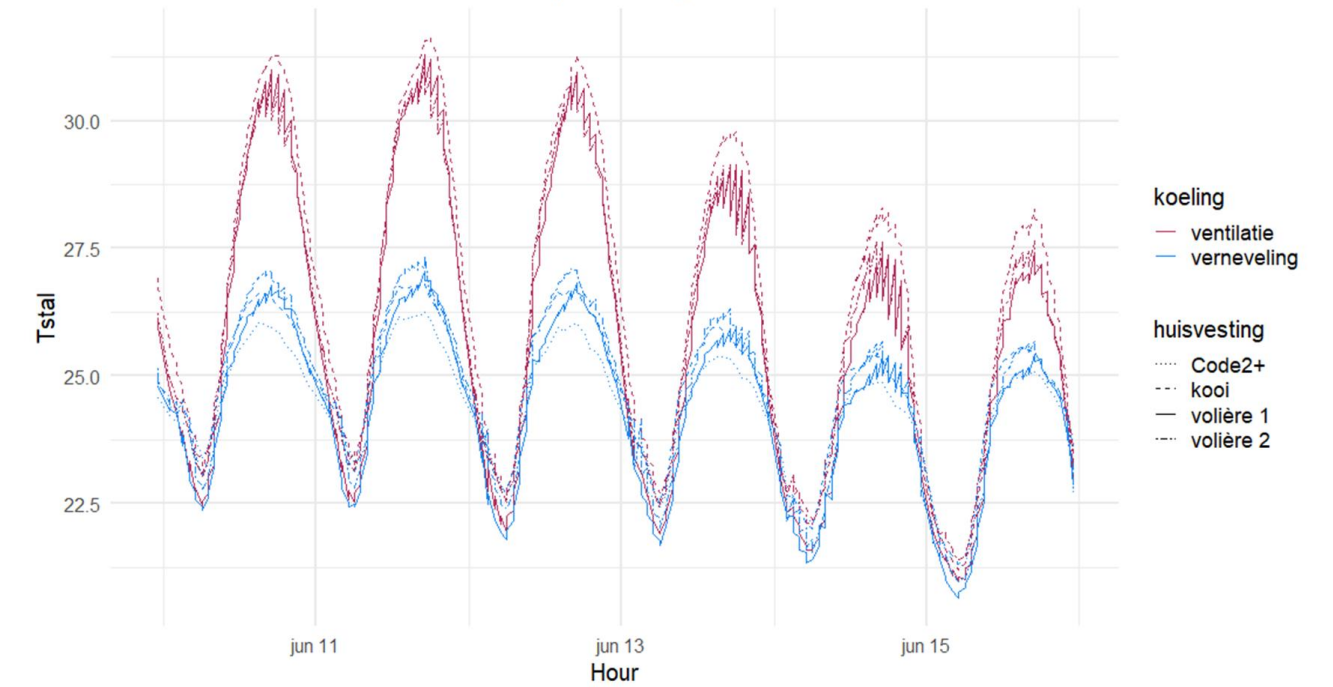
huisvesting

- Code2+
- - - kooi
- volière 1
- - - volière 2

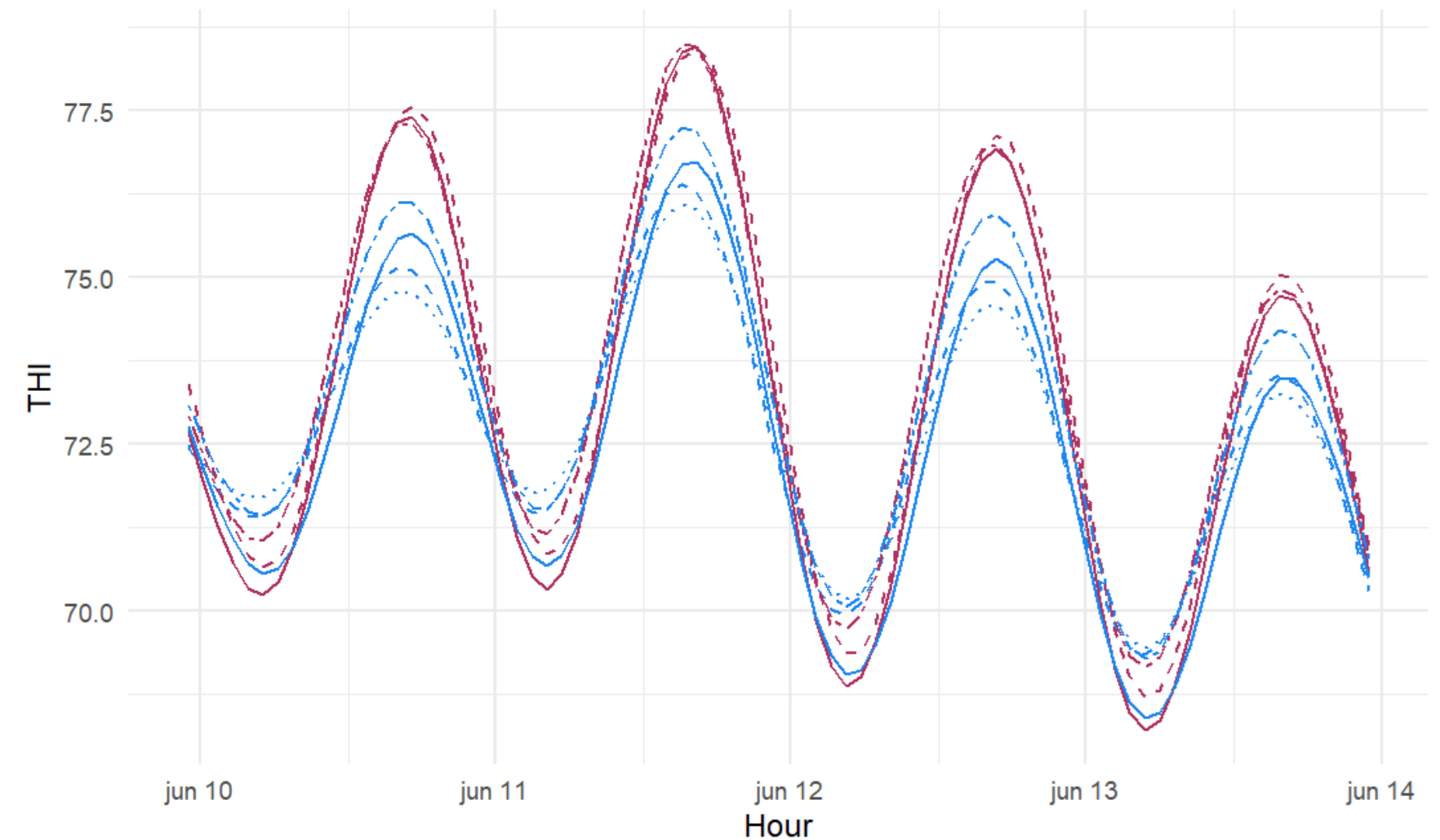
Relatieve vochtigheid per uur



Staltemperatuur per uur



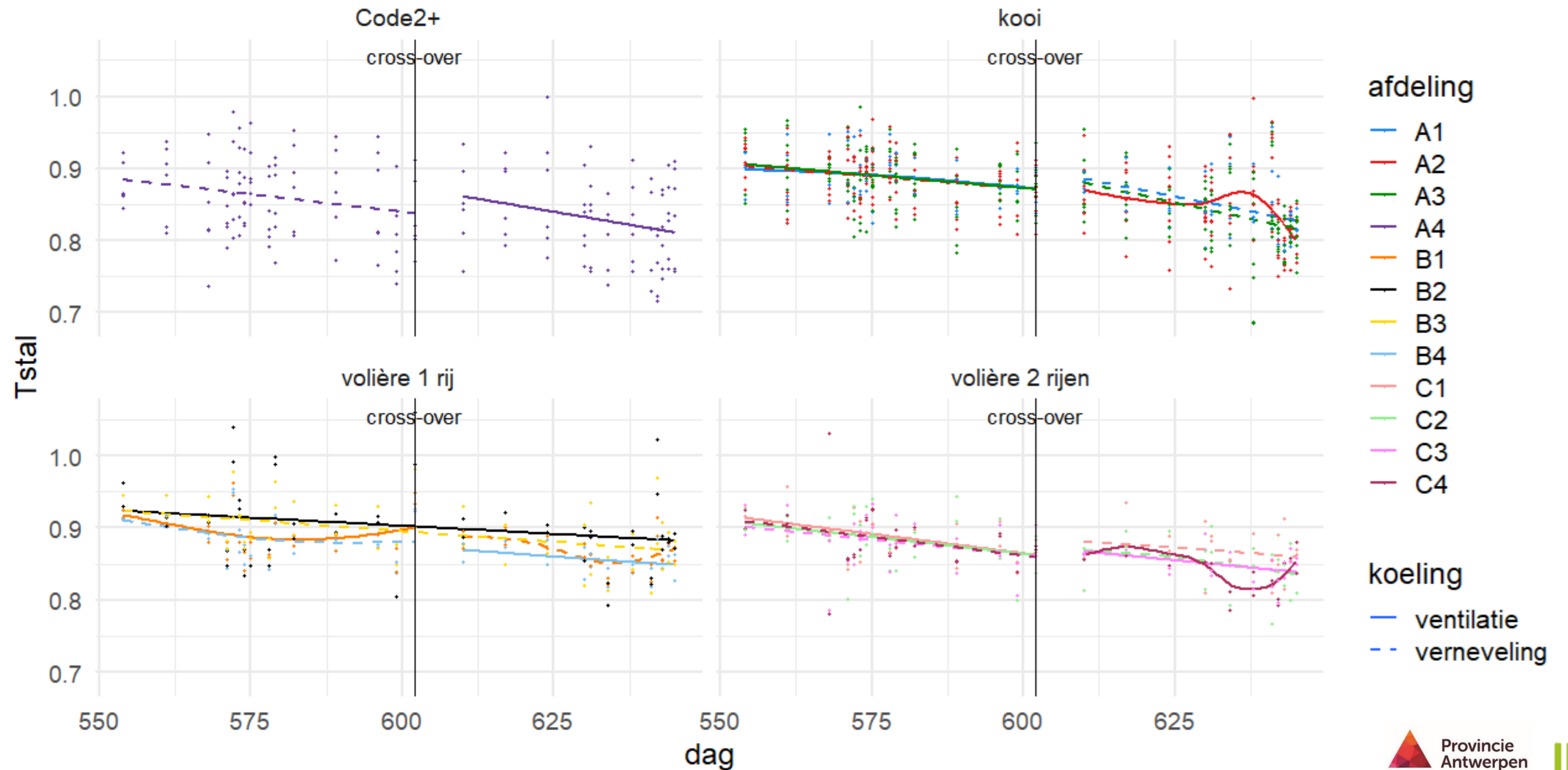
THI per uur



Leghennen

PRODUCTIE - visueel

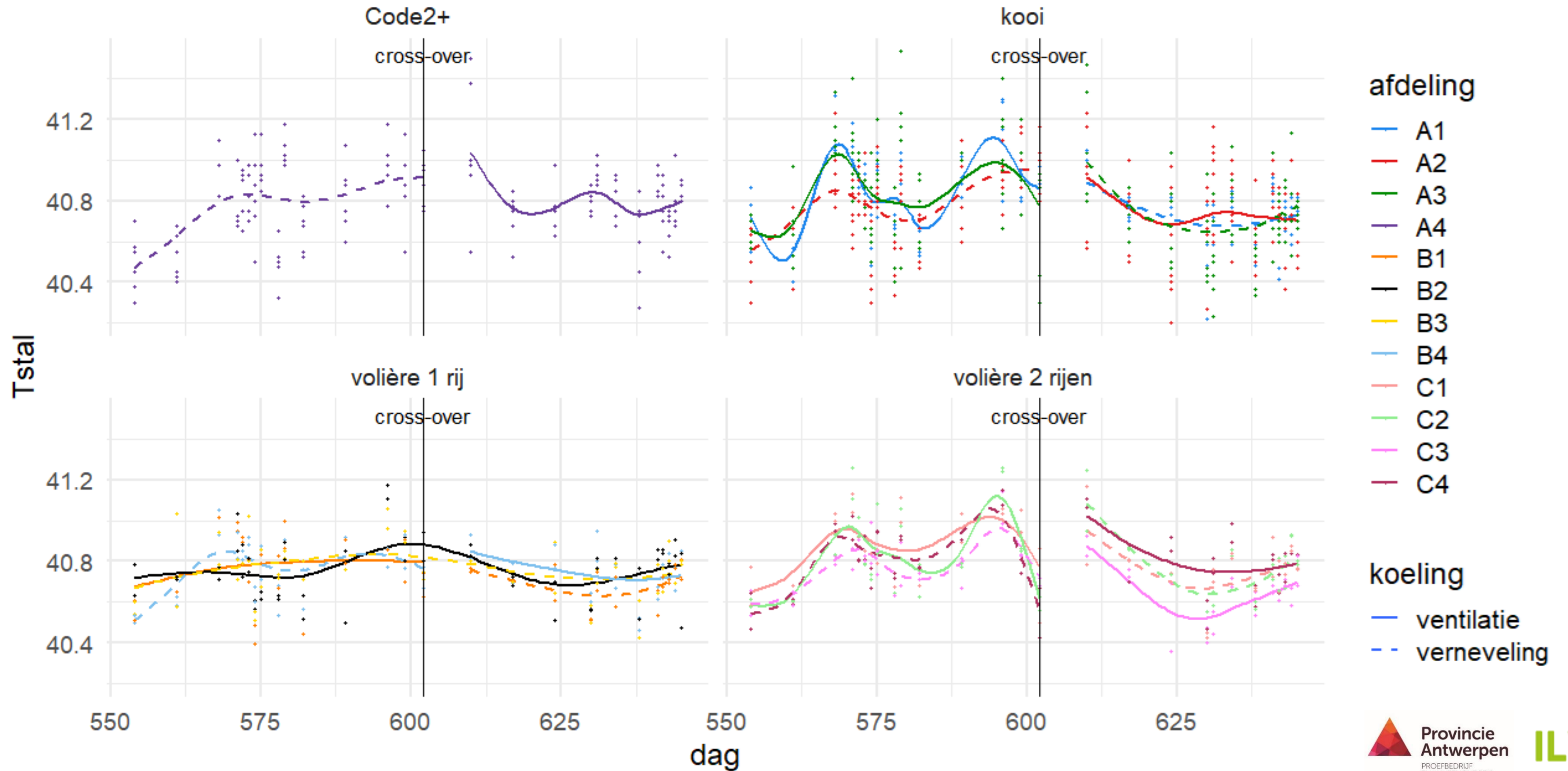
Gemiddeld legpercentage per dag



Leghennen

PRODUCTIE - visueel

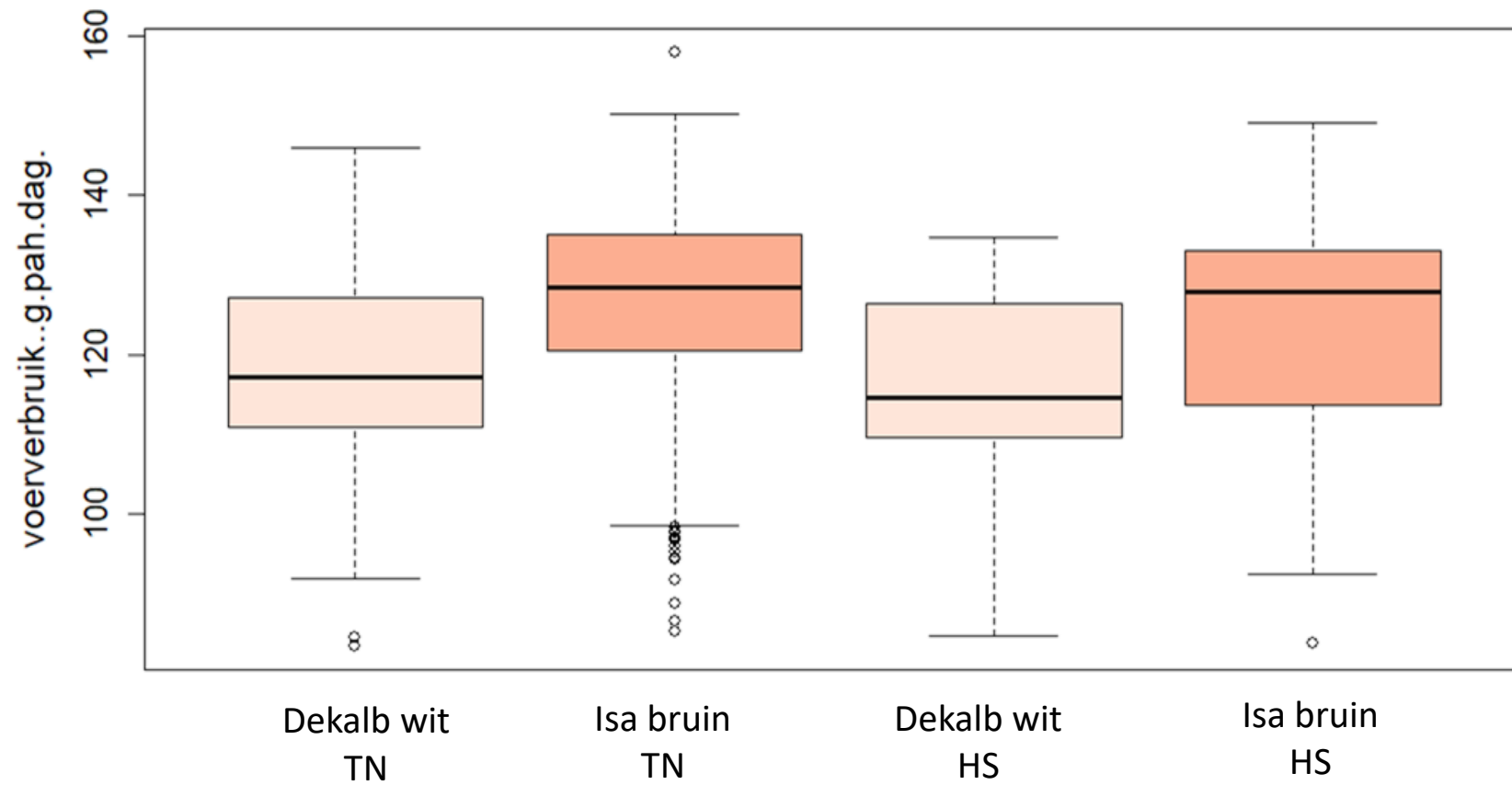
Gemiddeld rectale temperatuur per dag



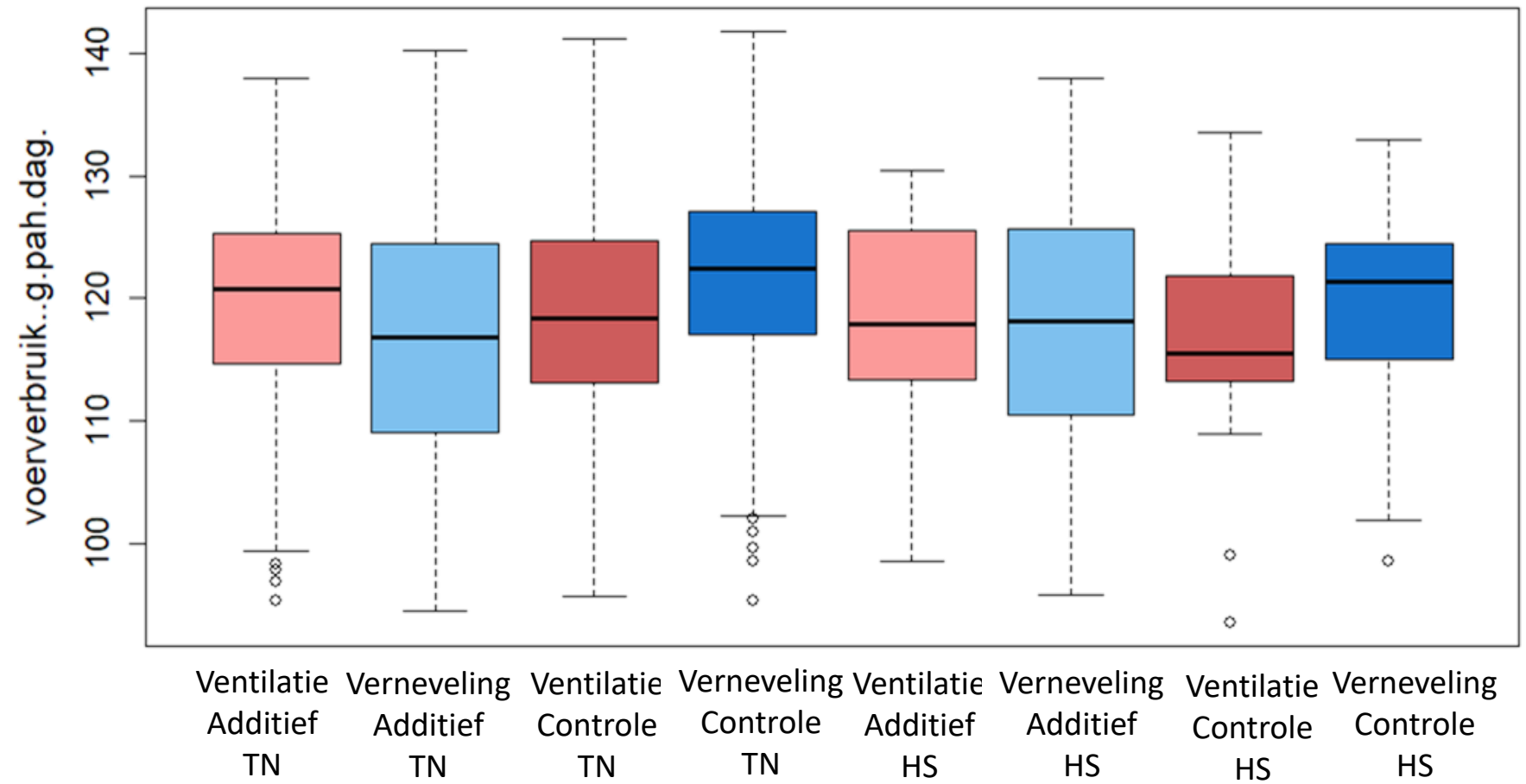
Leghennen

Voerverbruik (g/hen/dag)

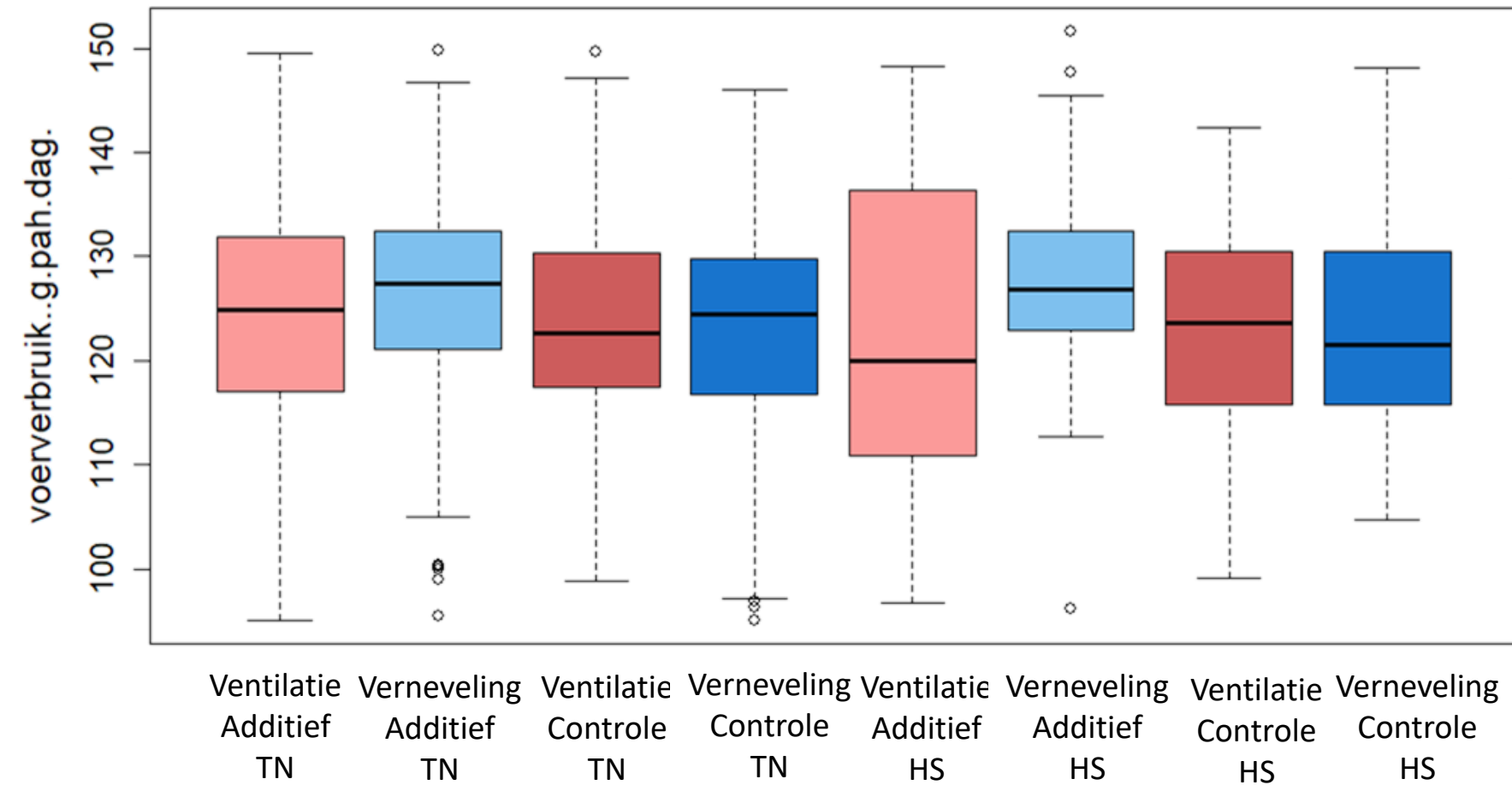
Kooi



Volière 1



Volière 2

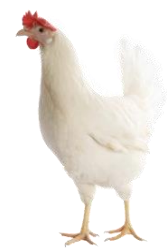
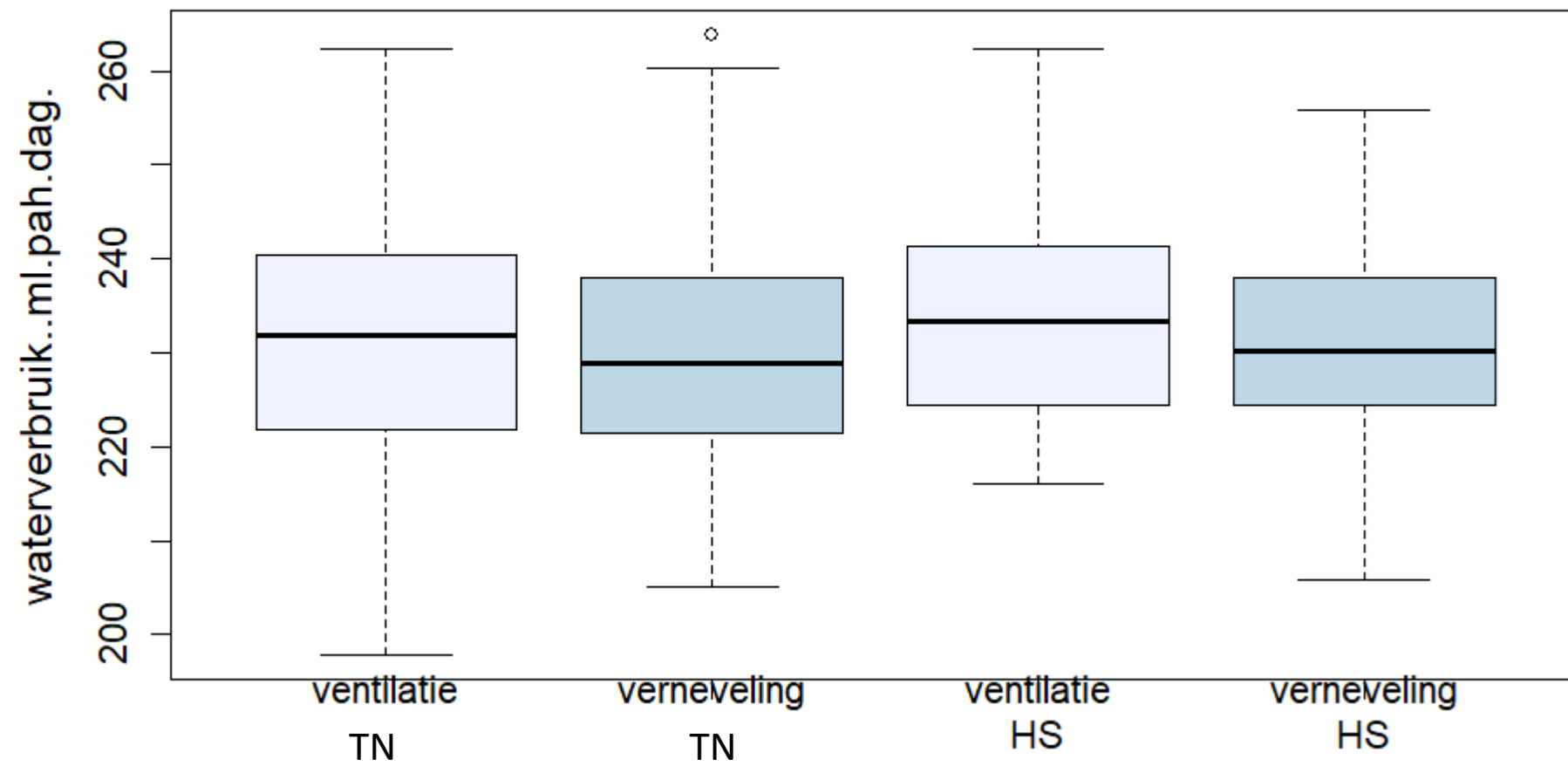


Leghennen

WATEROPNAME (mL/hen/dag)

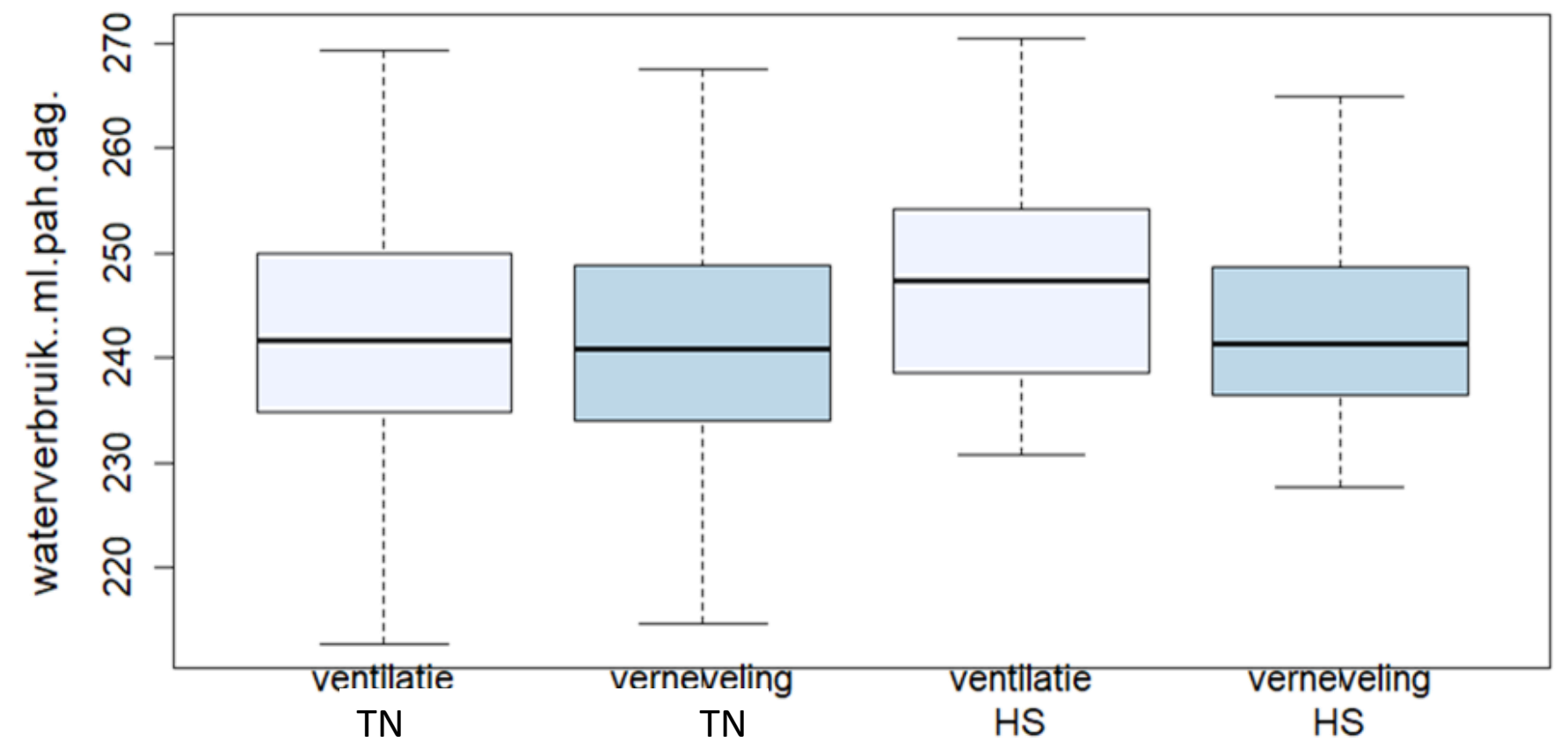
Volière 1

waterverbruik..ml.pah.dag.



Volière 2

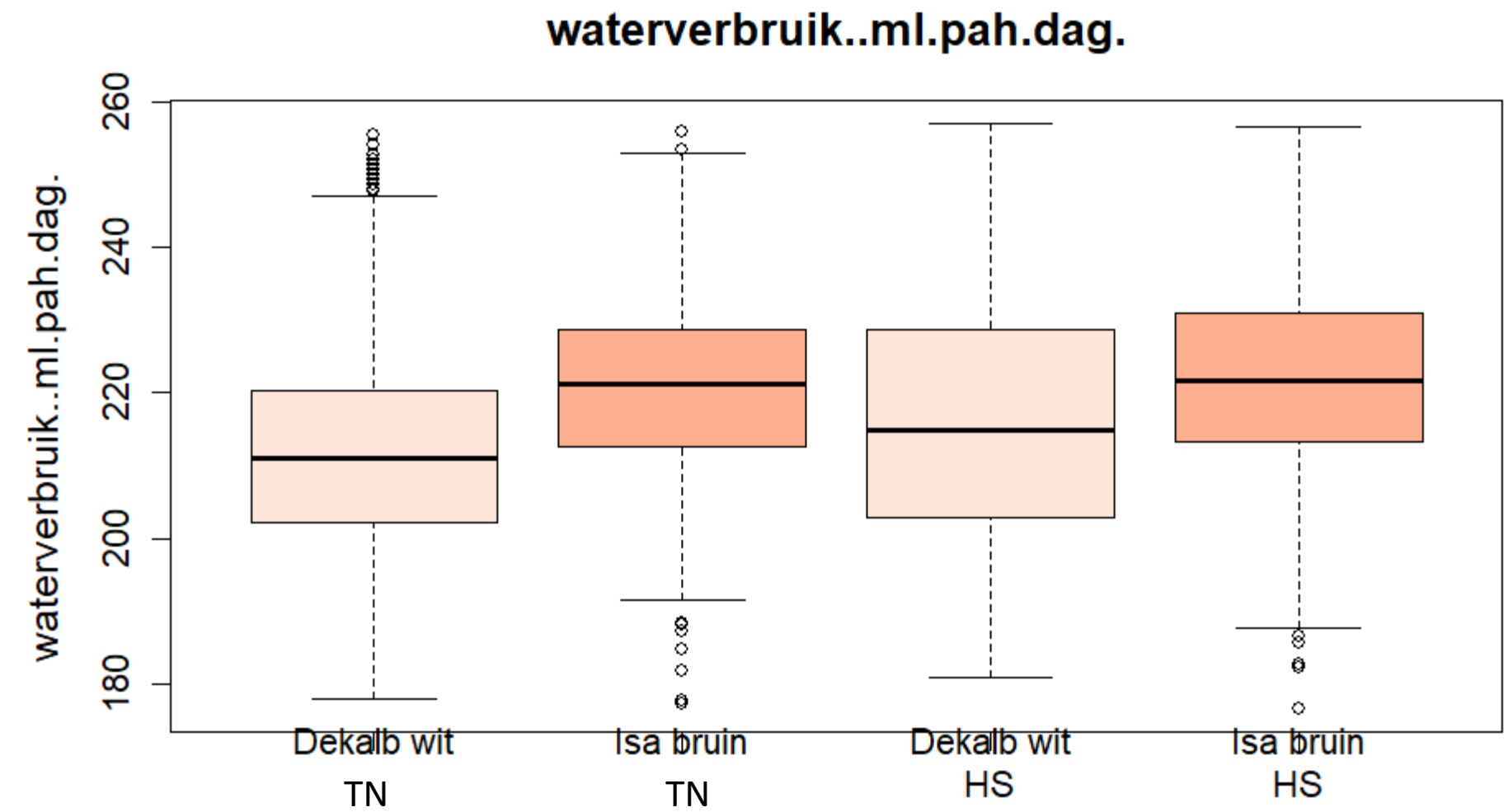
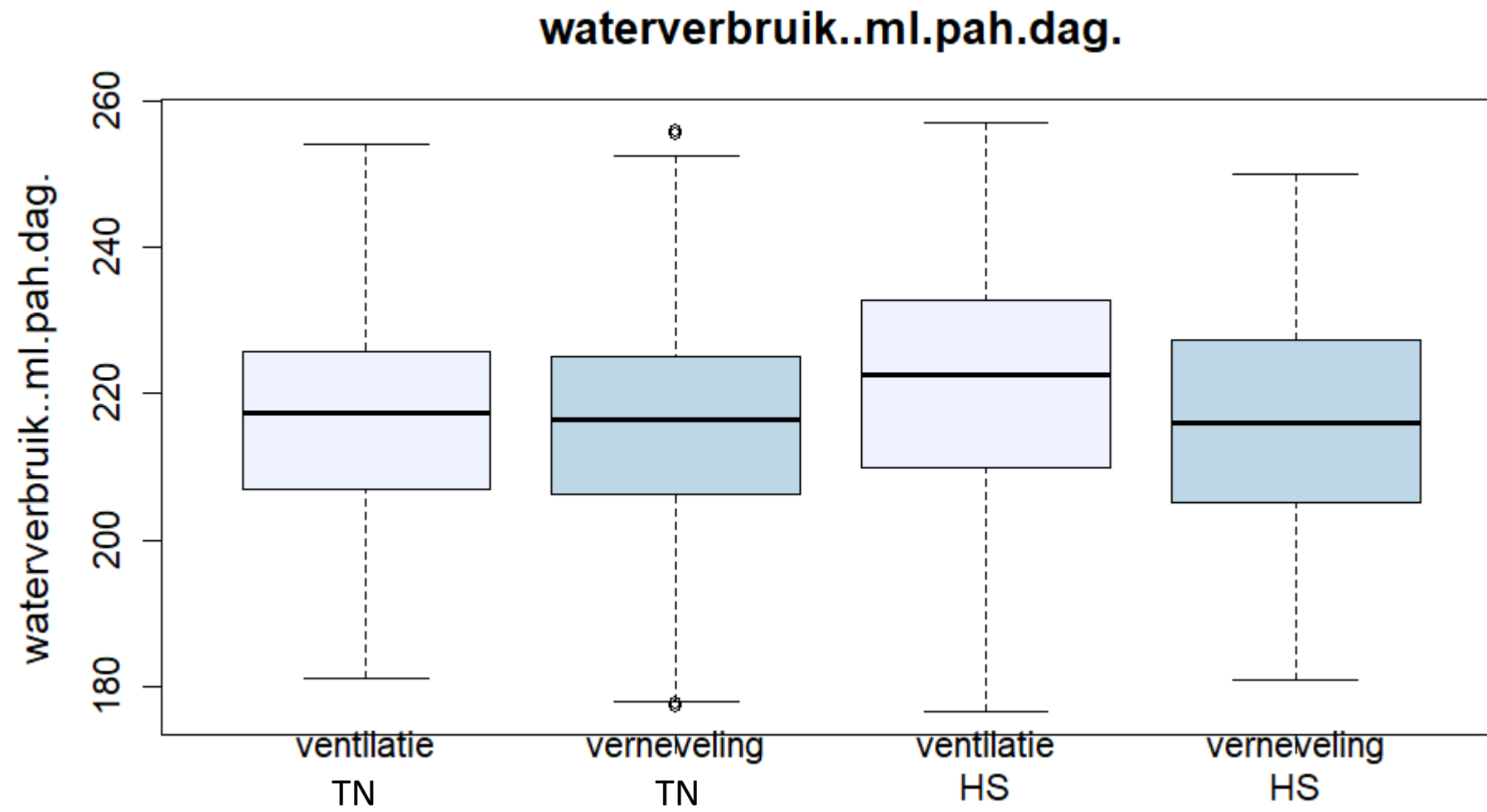
waterverbruik..ml.pah.dag.



Leghennen

Kooi

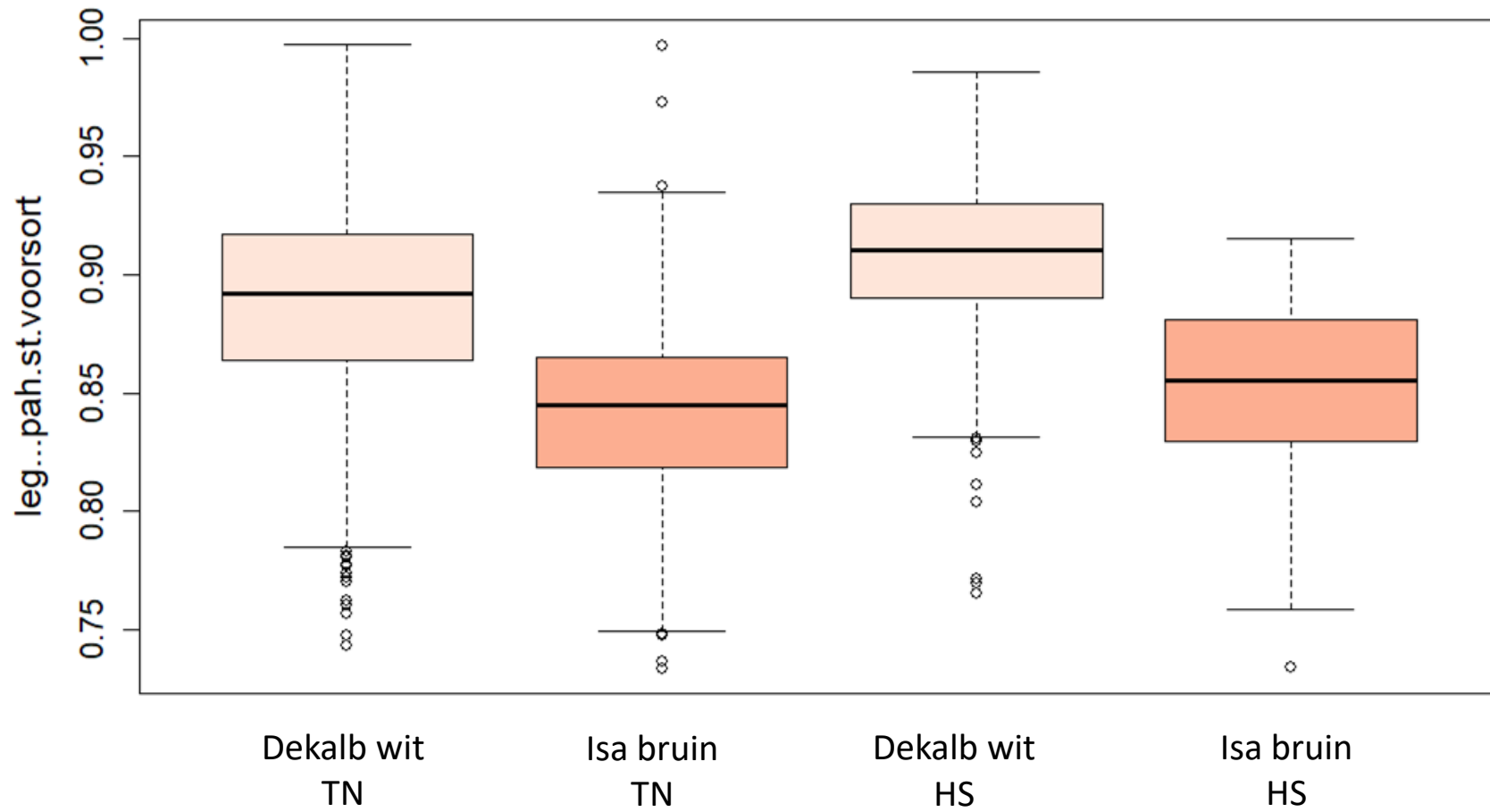
WATEROPNAME (mL/hen/dag)



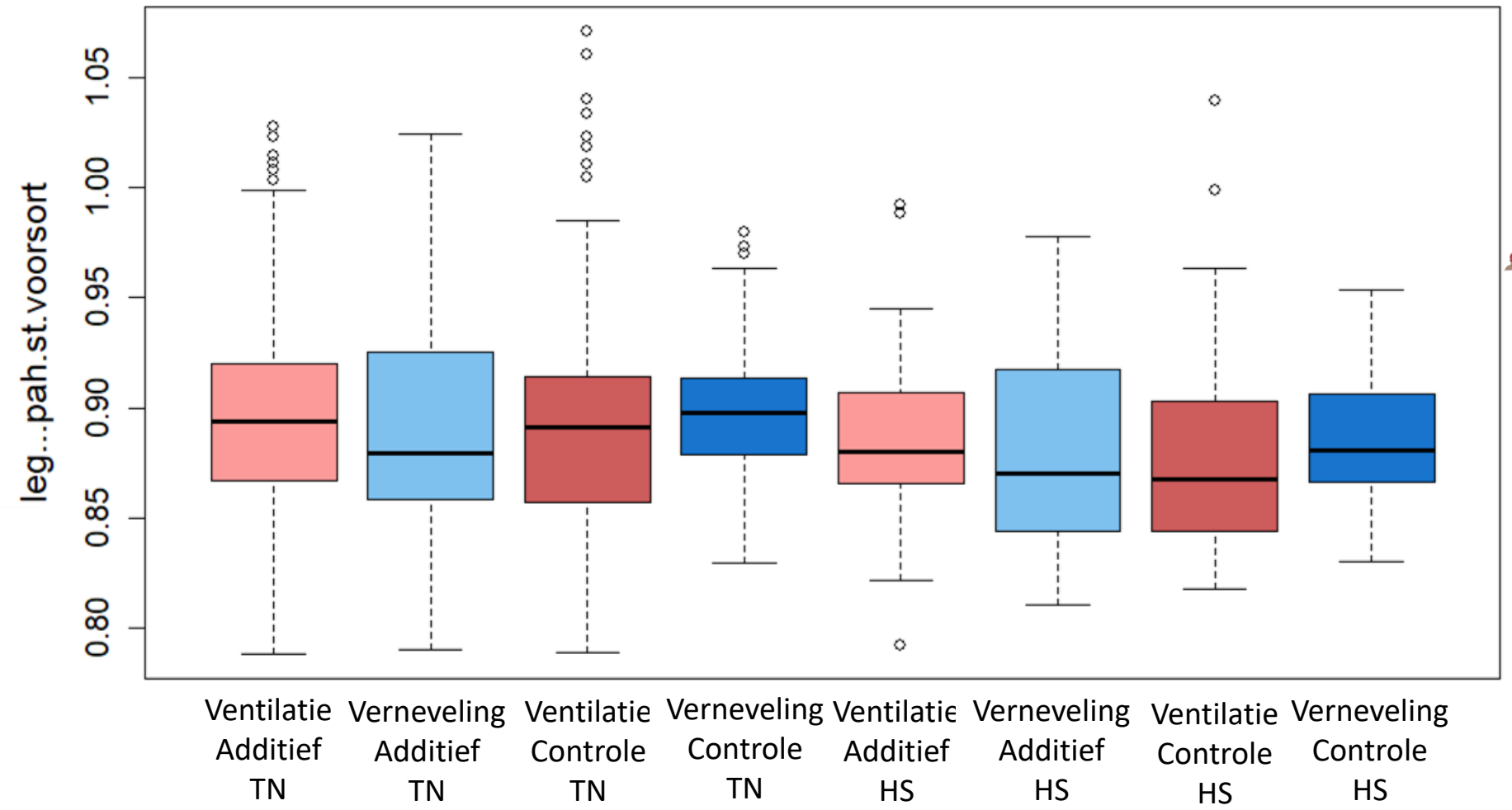
Leghennen

LEGPERCENTAGE

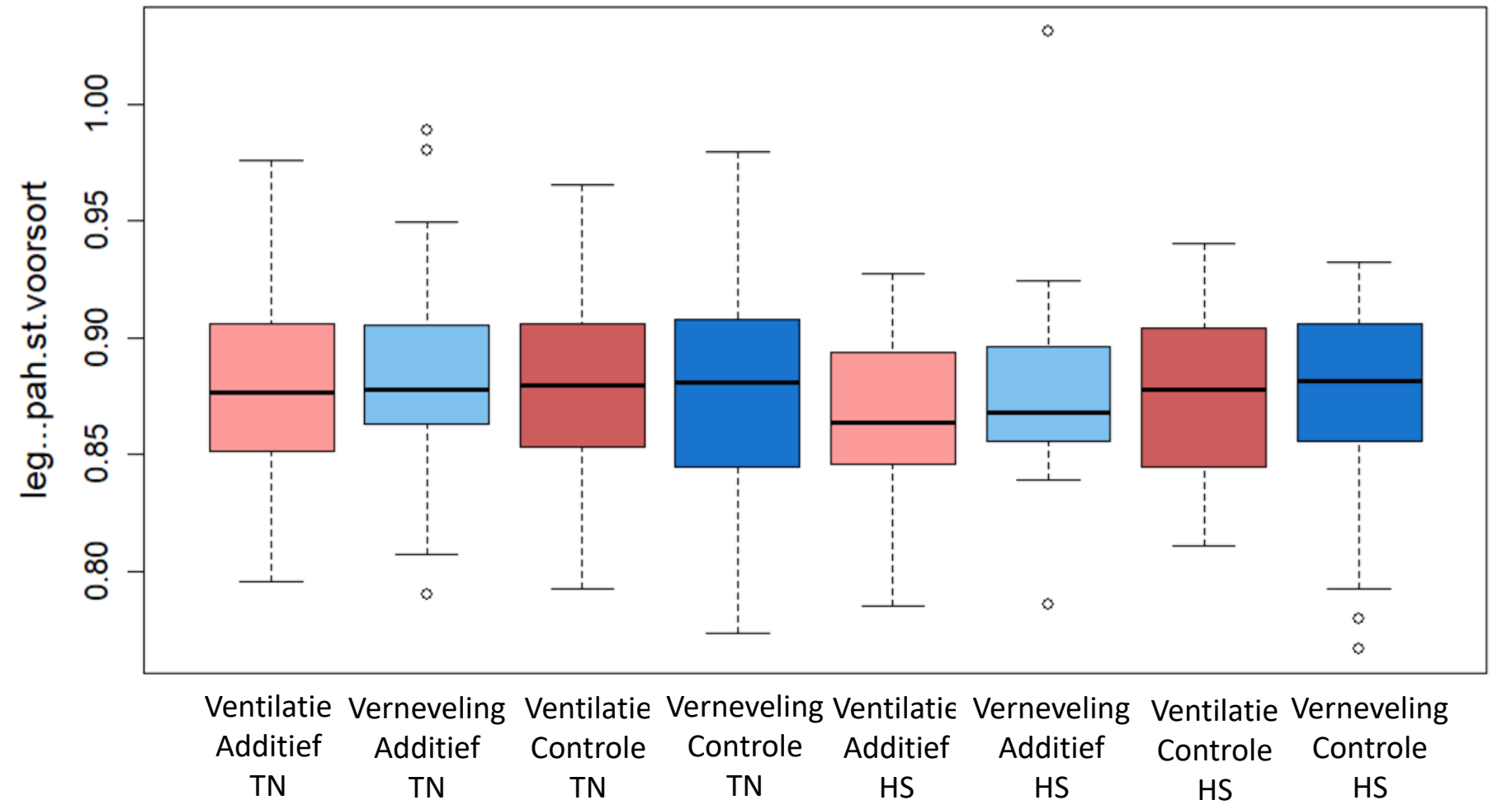
Kooi



Volière 1

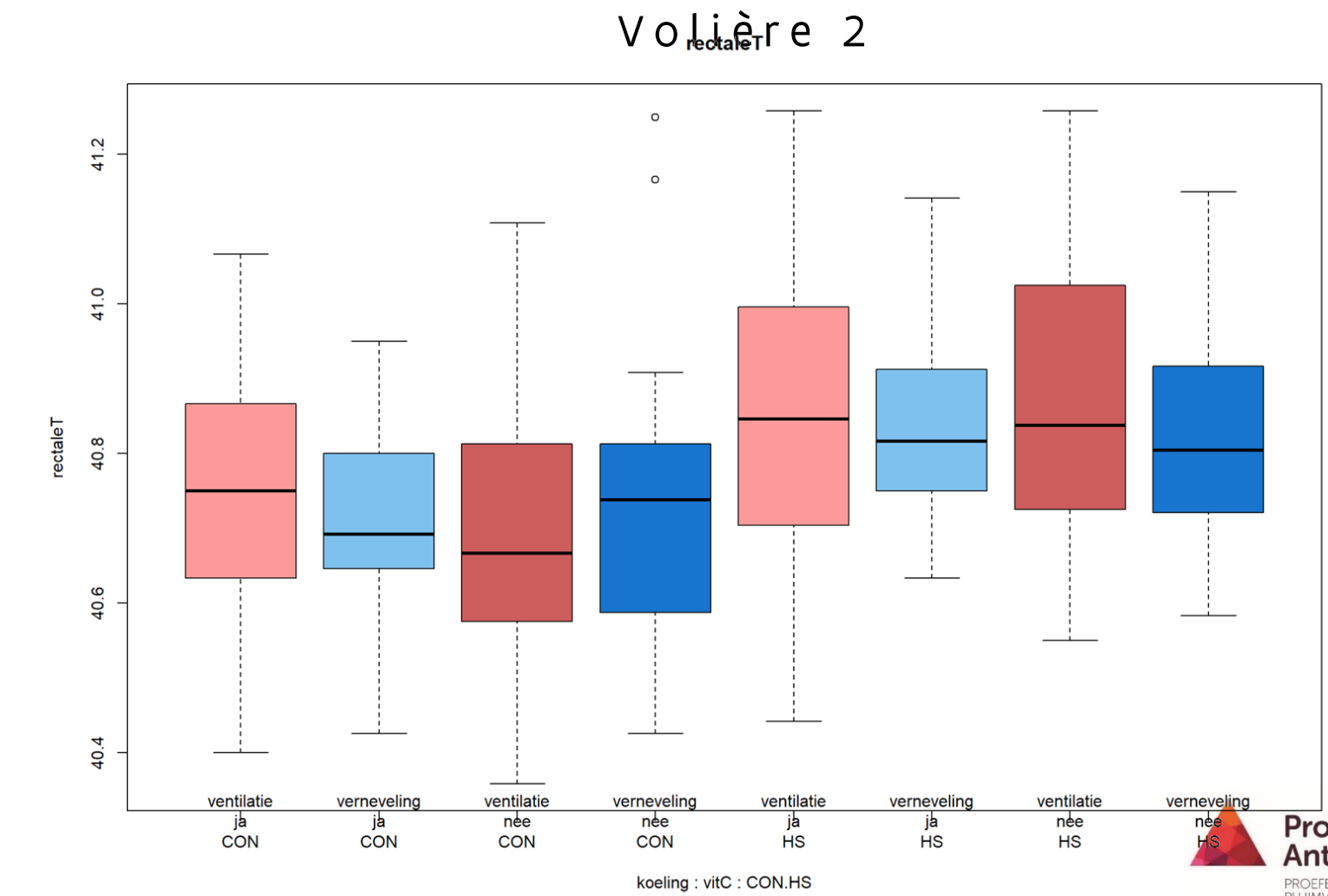
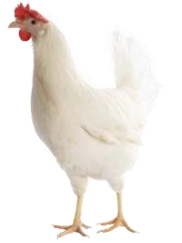
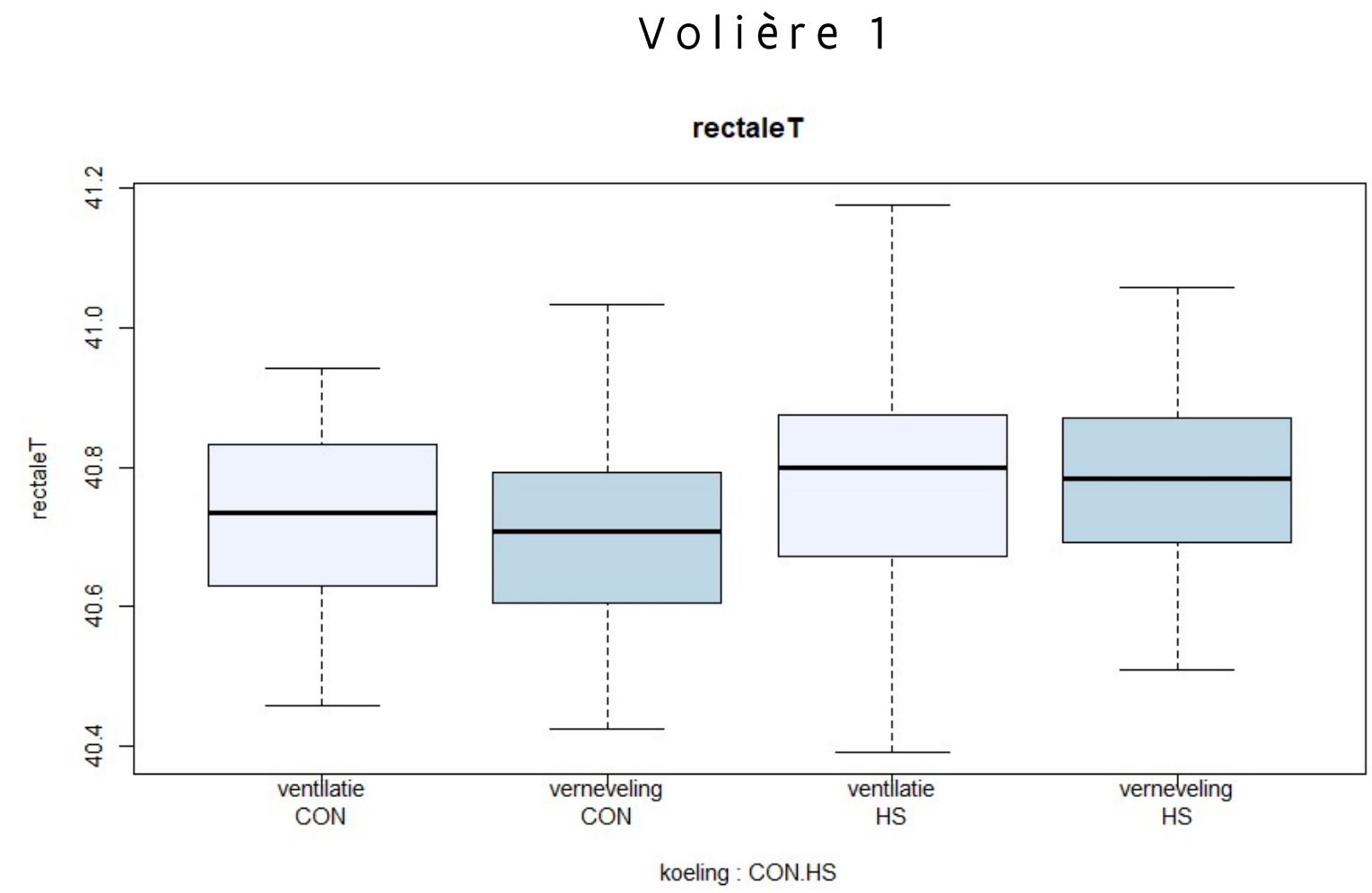
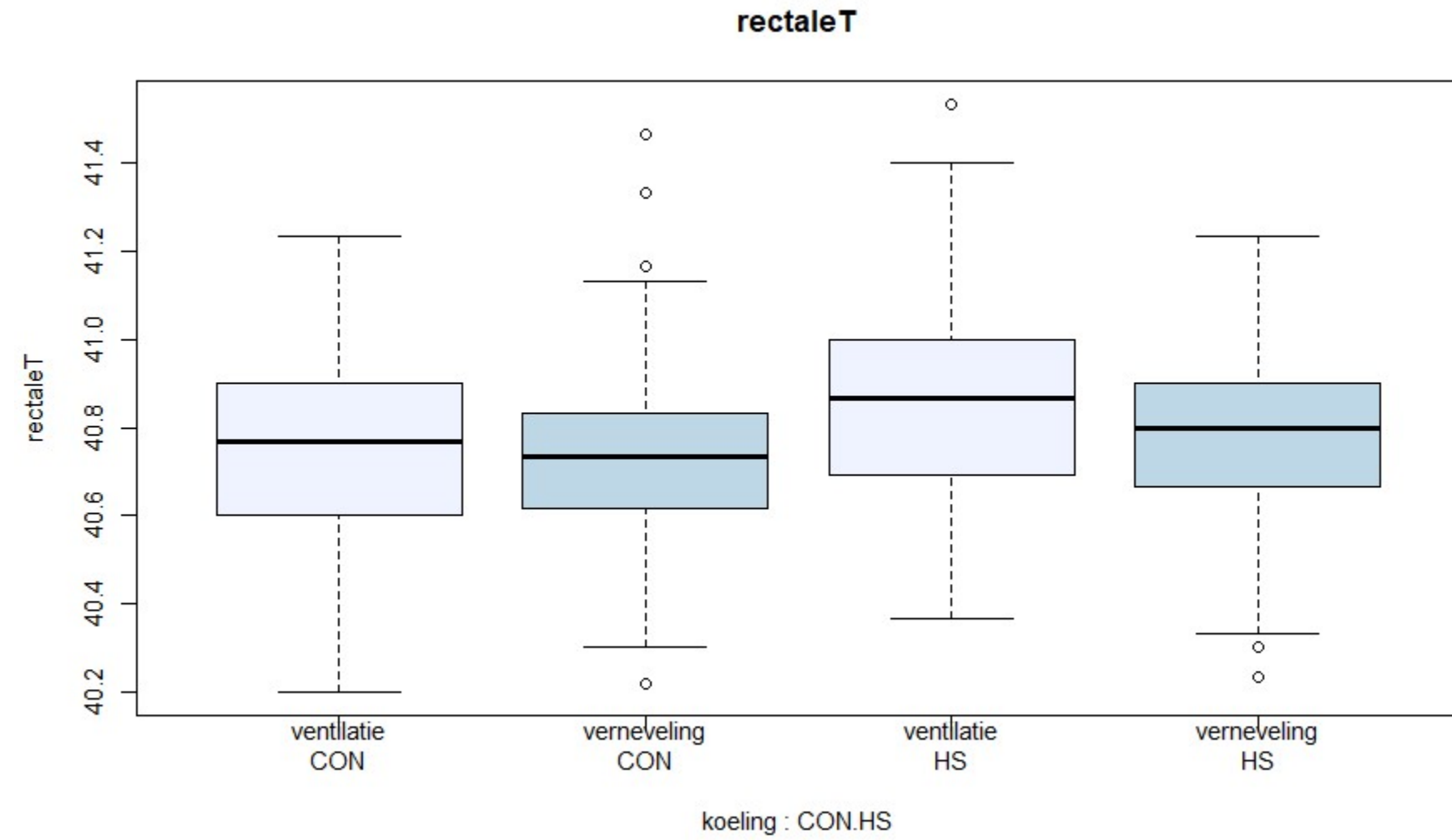


Volière 2



Leghennen

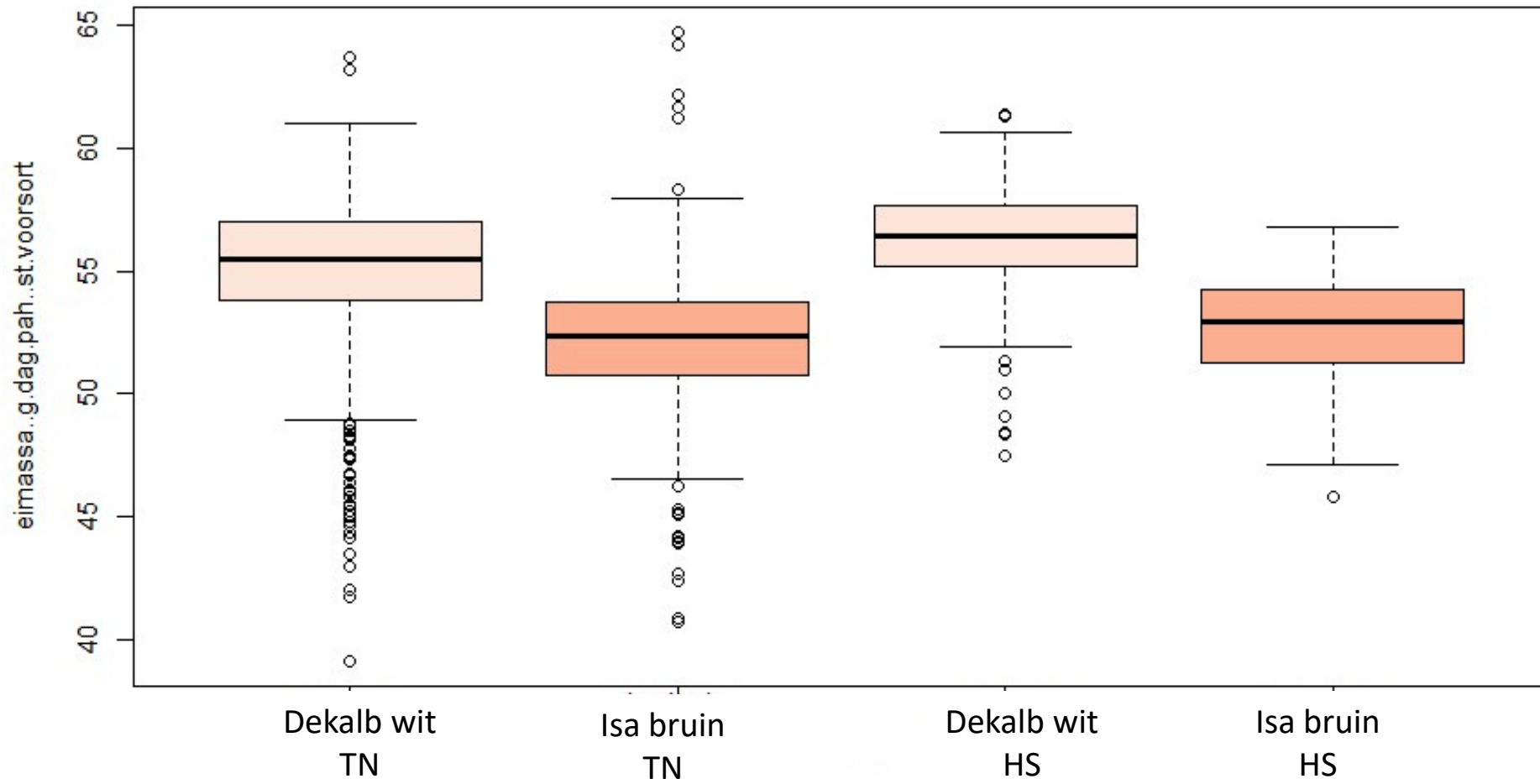
RECTALE TEMPERATUUR



Leghennen

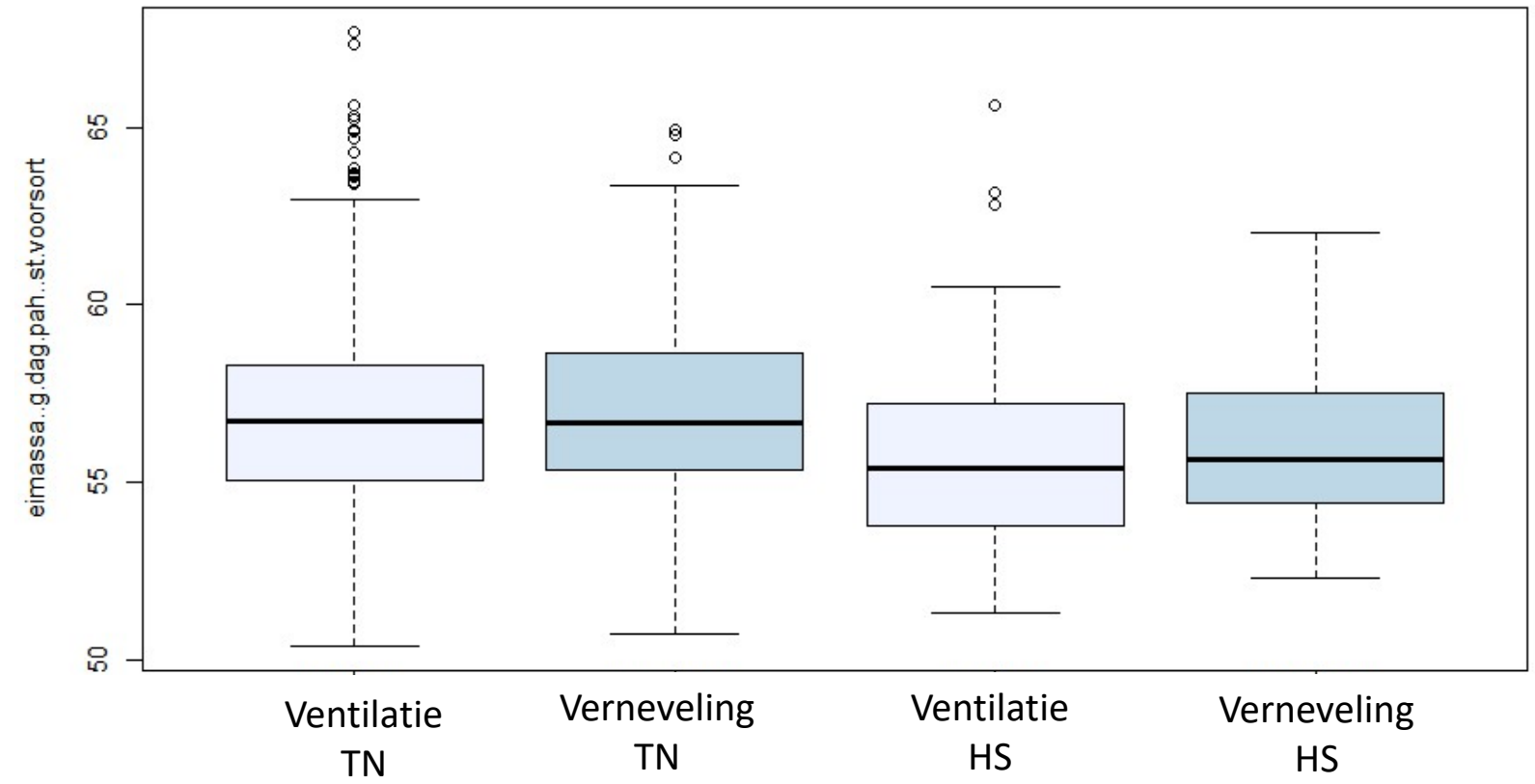
EIMASSA (g/hen/dag)

Kooi



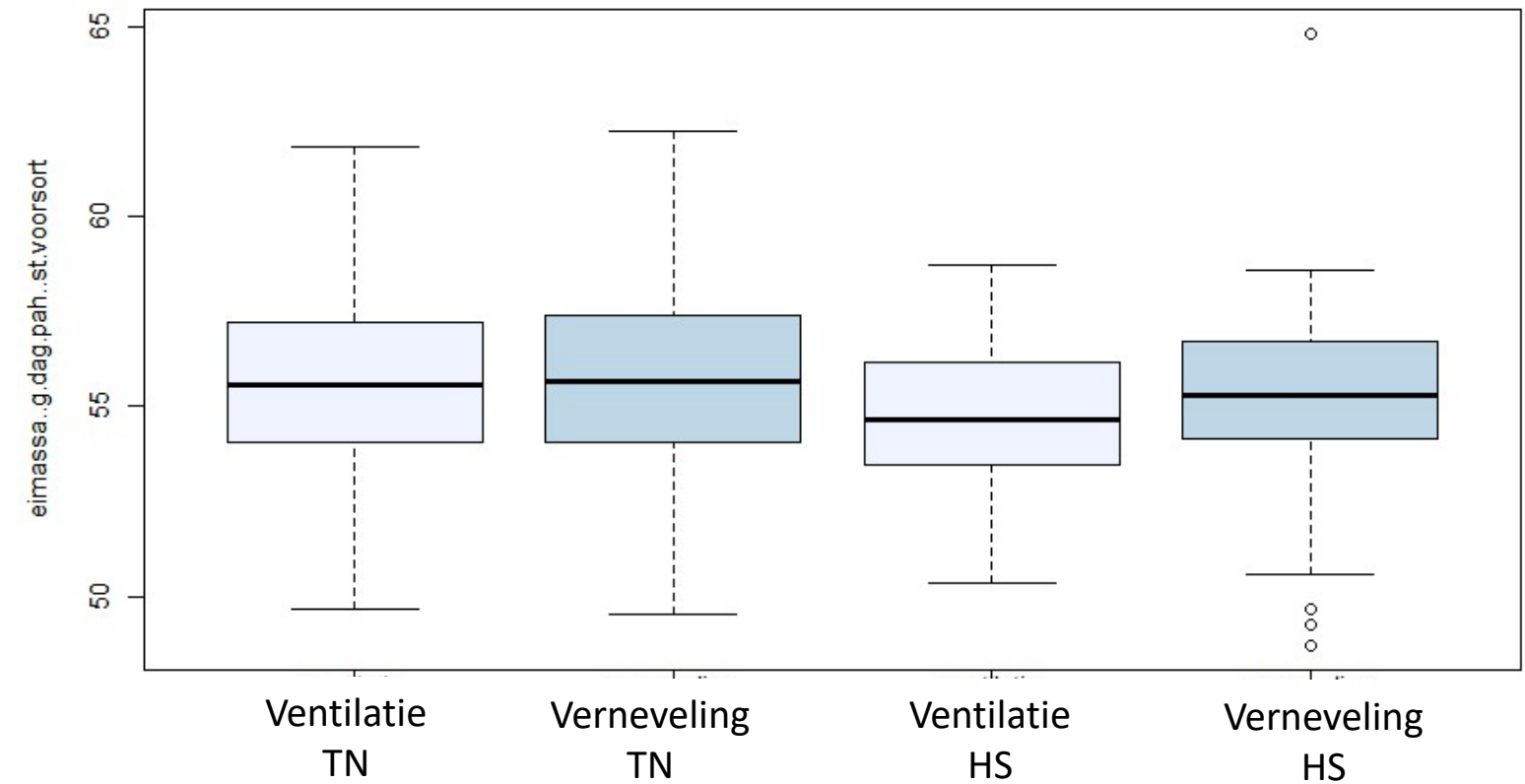
Volière 1

eimassa..g.dag.pah..st.voorsort



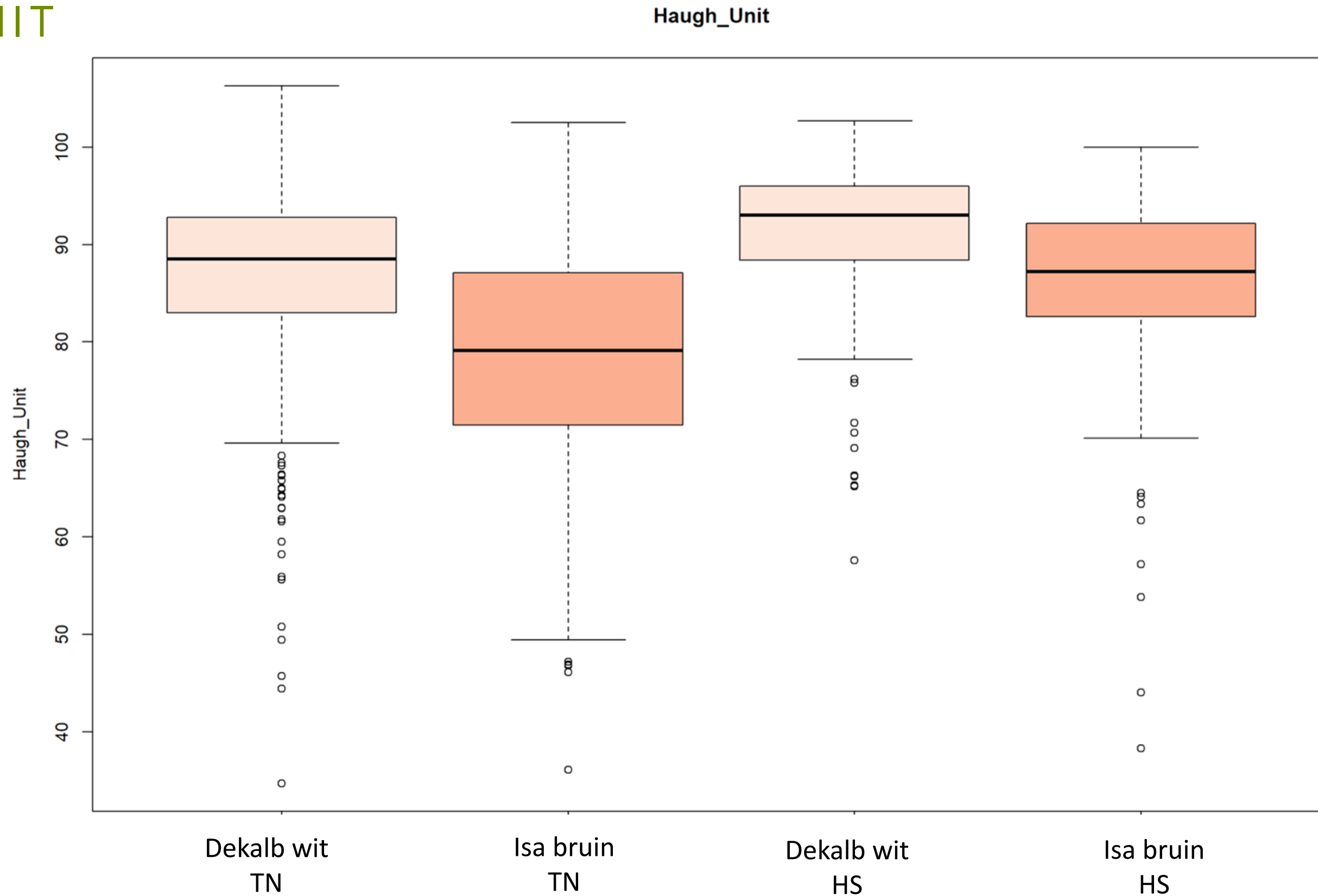
Volière 2

eimassa..g.dag.pah..st.voorsort



Leghennen

HAUGH UNIT





Conclusie

Stalklimaat

- Verneveling: lagere staltemperatuur (3-5 graden)

Prestaties

- Weinig effecten
- Raseffecten: voeropname, wateropname, leg%

Dierparameters

- Hittestress (numeriek)
- Weinig effect behandelingen

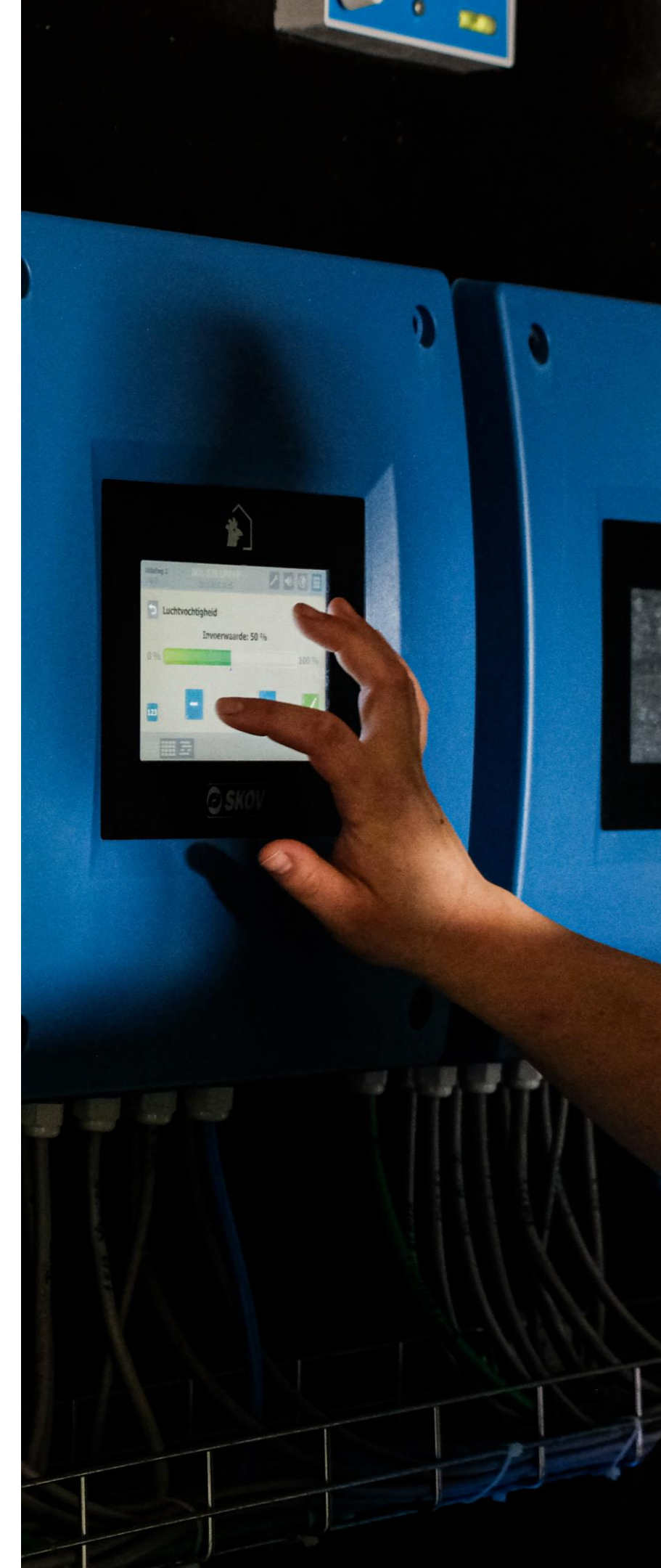
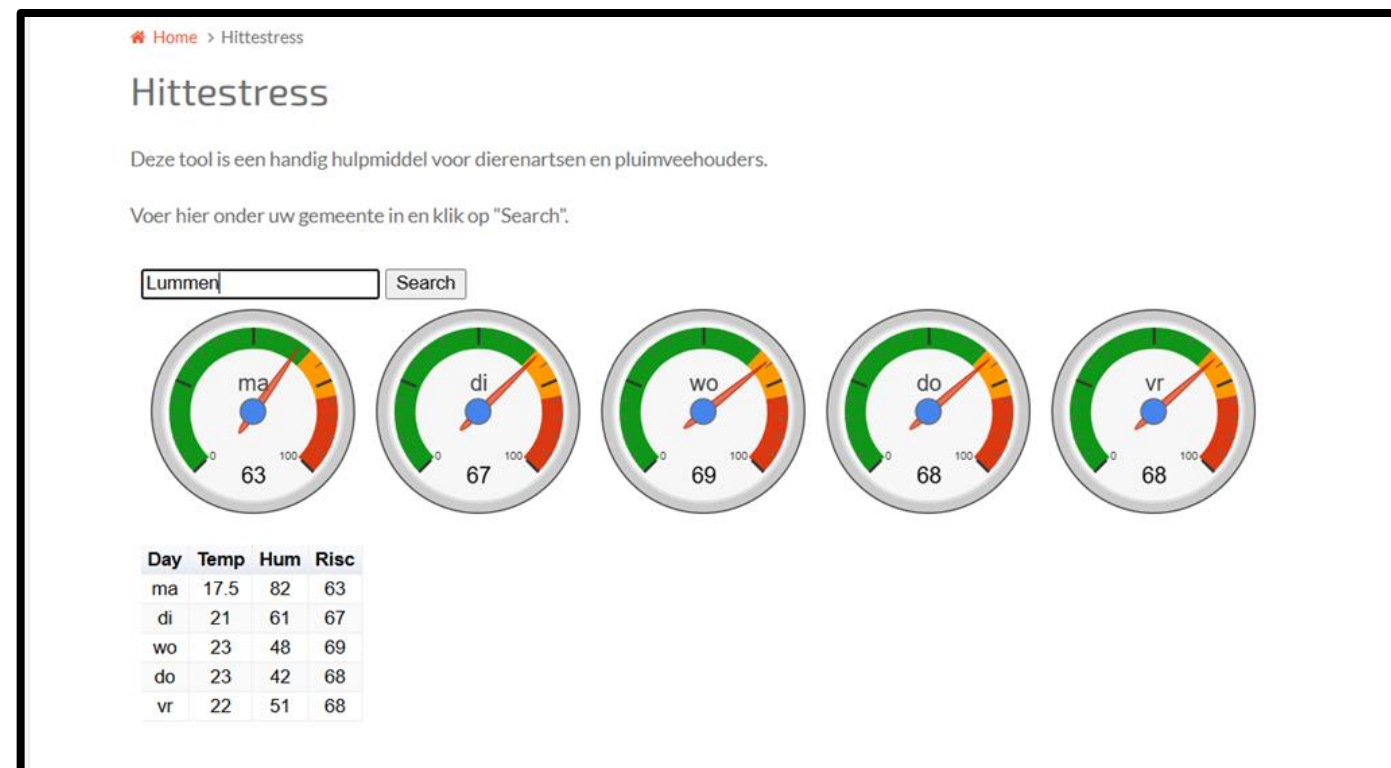
Eikwaliteit

- Raseffecten: haugh unit
- Leeftijdseffecten: eischaalsterkte, dooierhoogte, dooierdiameter

HITTE-TOOL



- **THI-index als maat voor hittestress**
 - Formule: $THI = 0.8 \times T + ((RV/100) \times (T - 14.3)) + 46.4$ (Thornton et al., 2021)
 - Index die niet enkel omgevingstemperatuur meeneemt, maar ook andere parameters
 - Relatieve vochtigheid
 - Opm: neemt geen lichtsnelheid mee!
 - Grenswaarden zijn diersoortafhankelijk
 - En verschillende formules beschikbaar!



HITTE-ACTIEPLAN

- Overzicht van maatregelen

Opbouw:

- Korte termijn
 - Management
 - Verschuiven voederbeurten
 - Aanpassen lichtschema
 - Drinkwater
- Middellange termijn
- Lange termijn

Maatregelen op korte termijn

Management

Verschuiven voederbeurten ▼



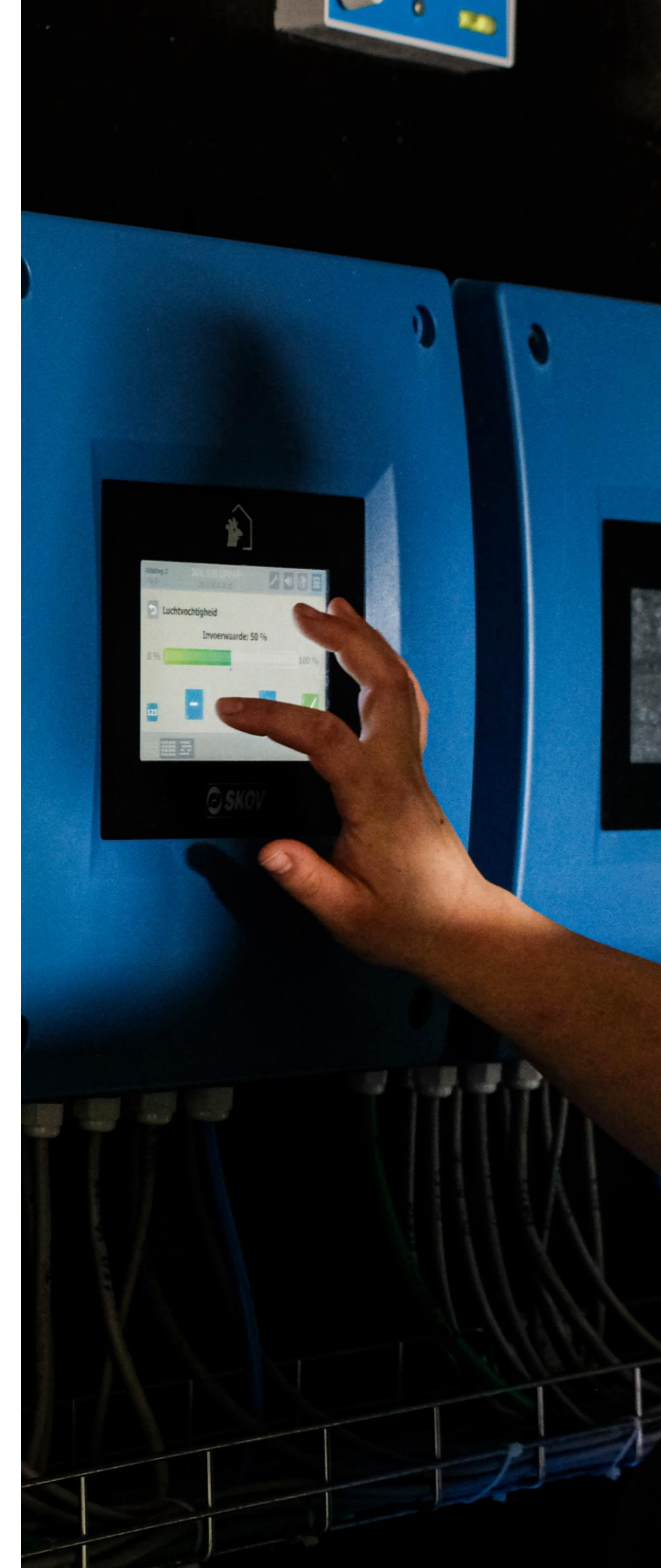
- eenvoudig toe te passen
- verlaagt de warmte geproduceerd door de kip zelf
- verlaagt de lichaamstemperatuur



- mogelijk een lagere voederopname
- het opnieuw verschaffen van voeder kan stormloop



- Het verschuiven van voederbeurten kan helpen om σ via de vertering wordt op die manier vermeden. De l koelere momenten.
- Opgelet: Besteed voldoende aandacht aan het terug aangezien dit extra sterfte kan veroorzaken.



Bedankt!

VRAGEN?



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