



BODY COMPOSITION OF PORK CARCASSES SLAUGHTERED AT THE SAME AGE AS INFLUENCED BY HIGH AMBIENT TEMPERATURE



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The climate change is provoking more heat waves in certain temperate areas. High ambient temperature is also an important issue in the great farming tropical areas. Pigs reduce their feeding consumption as an adaptive response to reduce heat production (Renaudeau et al., 2011). The study objective was to evaluate the effects of elevated temperature on carcass composition and the relative importance of each primal cut of pigs slaughtered at the same age.

Conclusion

In summary, heat stress decreased live, carcass and cuts weights at the same age. The lower fatness, counterbalanced by a higher muscularity and bone content, could be explained by feed restriction.

Material and Methods

- Sample of 48 females reared for 60 days from 80 days of age
- In 2 groups, each in a room with 8 pens:
 - One at thermoneutrality (TN 18-24°C),
 - The other at a 10°C higher temperature (HS 28-34°C).
- Ad libitum access to a standard growing-finishing feed
- Slaughtered at 140 days and classified with CGM device
- Half-carcasses scanned by Computed Tomography (reference) (Fig. 1) to measure the weights of muscle, fat and bones

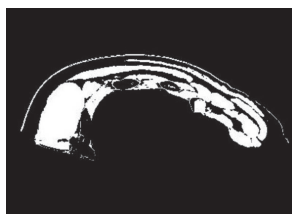


Fig. 1 – Scan of a half-carcass

Fig. 2 – Displaying tissues on a slice

- Standard commercial cutting to measure the weights and proportions of cuts, including backfat
- Analysis by using a mixed model (Proc mixed de SAS) with temperature as fixed effect and block as random effect

Results

- Significant heat effect on 17 variables among the thirty variables analyzed (Tab.)
- Significant decrease (Fig. 3 et 4) of:
 - live and carcass weights,
 - weight of loin, shoulder, belly and head,
 - backfat weight and lumbar fat depth,
 - weight of fat, muscle and bone,
 - % of fat,
 - carcass length.
- Significant increase (Fig. 4) of ham weight and % of muscle
- No significant effect on carcass grading, likely because of power lack

Table – Effect of heat stress on body composition

Variable	TN	HS	HS - TN	Effect
Live weight, kg	104,8	96,9	-7,9	***
Carcass weight, kg	79,2	73,8	-5,4	
Loin weight, kg	21,4	19,4	-2,0	
Shoulder weight, kg	18,2	16,8	-1,4	
Ham content, %	26,4	27,3	0,9	
Bone weight, kg	13,4	12,7	-0,7	**
Carcass length, cm	96,6	94,2	-2,4	
Belly weight, kg	9,0	8,4	-0,6	
Head weight, kg	4,5	4,3	-0,2	
Muscle weight, kg	48,4	46,1	-2,3	
Fat weight, kg	14,1	11,9	-2,1	*
Lumbar fat depth, mm	11,2	9,2	-2,0	
Backfat weight, kg	3,8	3,4	-0,4	
Ham weight, kg	19,6	18,8	-0,8	
Loin content, %	28,9	28,1	-0,8	
Muscle content, %	62,3	61,1	-1,2	
Fat content, %	16,1	17,6	1,5	

TN : thermoneutrality, 18-24°C ; HS : 28-34°C ; LSmeans, n = 24 by treatment

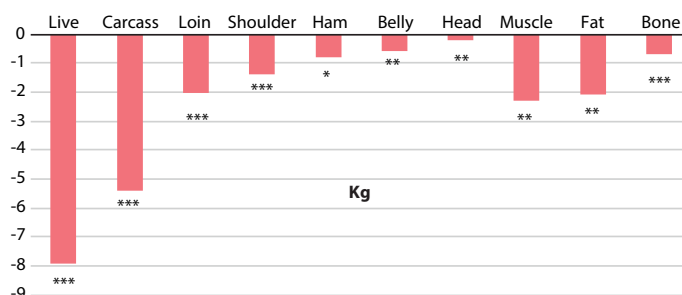


Figure 3 – Significant differences of weight (HS - TN)

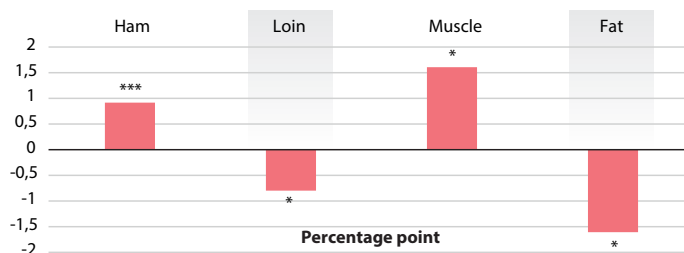


Figure 4 – Significant differences of content (HS - TN)

Reference

- Renaudeau, D., Gourdiine, J. L., & St-Pierre, N. R. (2011). A meta-analysis of the effects of high ambient temperature on growth performance of growing-finishing pigs. J. Anim. Sci., 89(7), 2220-2230.