Infrared thermography technology as a promising tool for assessing temperament of water buffaloes

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Introduction

Non-invasive methods for assessment of animal temperament are looked for constantly. The main proposal is that these methods can avoid any interference between the observer and the animal, and allow which the animal demonstrate the real behavior.

Objective

Evaluate the use of the infrared thermography (IT) as a tool to identify the temperament of water buffaloes in growing phase in feedlot.

Material and Methods

- ✓ 75 animals of 3 genetic groups of water buffaloes (n=25 for each GG);

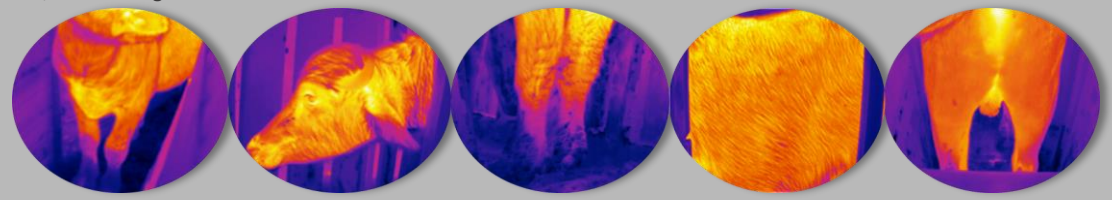
- ✓ Jafarabadi, Mediterranean, and Murrah, respectively;
- ✓ 390±32 days of age;
- ✓ 310±61.27 kg of initial body weight;
- ✓ On day 0:
  - Temperament classification:
    Temperament score (TSc): mean of the sum of the scores of the time of entry into the squeeze chute (1 to 5: 1=greater time spent for entry; 5=less time spent for entry) and the exit velocity score (1 to 5: 1=lower speed; 5=higher speed).
    The animals were categorized:
    Adequate (ADQ; TSc≤3) or excitable (EXC; TSc >3).
  - Rectal temperature;
  - IT images were obtained (Testo 882 Thermal Imager, Testo, Inc, Germany) from regions:
    chest, eye, snout, cheek, foreleg (left side), ribs, rear area (left side), and scrotum.
- ✓ Statistical analyses:
  - MIXED procedure in SAS;
    GG, temperament, and the resulting interaction – fixed effects;
  - Correlation analysis - CORR procedure of SAS.

Results

Table 1. Means and probabilities for thermographic variables measured at different body regions of growing water buffaloes in feedlot and classified according to temperament.

	Temperament				*Correlation*
Variables, °C	Adequate	Excitable	SEM	P-*value*	*TSc*
Rectal temperature	39.03	39.28	0.10	0.02	r = 0.36; P < 0.01
Chest	32.07	33.16	0.56	0.06	r = 0.35; P < 0.01
Eye	33.26	33.69	0.35	0.22	ns
Snout	28.09	28.29	0.51	0.70	ns
Cheek	31.63	31.87	0.44	0.58	ns
Foreleg (left side)	30.08	30.35	0.48	0.57	ns
Ribs	30.63	31.68	0.52	0.05	ns
Rear area (left side)	35.00	35.68	0.37	0.07	r = 0.33; P < 0.01
Scrotum	32.46	33.03	0.42	0.19	r = 0.23; P = 0.07

SEM = standard error of means; TSc = temperament score; P = significance considered if P ≤ 0.05 and tendency if P > 0.05 e P ≤ 0.10; ns = non-significant correlation.



infrared thermography images obtained from regions of chest, eye, snout, cheek, foreleg (left side), ribs, rear area (left side), and scrotum, respectively.

Highlights

- ✓ There was no effect of interaction;
- ✓ ADQ animals showed lower rectal and ribs temperatures than EXC animals.
- ✓ Tendencies for temperament effect were detected for chest and rear area;
- ✓ There was no effect of temperament for other variables.
- ✓ Positive correlations were verified between:
  - TSc and rectal temperature;
  - TSc and chest temperature;
  - TSc and rear area temperature;
  - Tendency was detected between TSc and scrotum temperature.

Conclusions

The temperament causes changes in the temperature of some body regions suggesting the IT technology may be a promising tool for assessing the temperament of water buffaloes.

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