VALIDATION STUDY OF THERMOGRAPHIC CAMERA: PRELIMINARY RESULTS

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Fever as clinical sign in pigs is measured through individual control by diferent kinds of thermometers. It is a time consuming procedure and the use of rectal thermometer can be disturbing to animals. Usage of thermography with help of mobile devices for assessing temperature in herds is unexplored and can be a useful tool for vets.

MATERIAL AND METHODS

DATA

ANALYSIS

The validation was made by comparison of rectal temperature of sows with images made with thermographic camera. Room temperature, relative humidity, speed of air, brightness and dirtiness were recorded for each case. We performed measurements in 250 sows located in 6 different farms in Sout-East and North-East Spain. The sows were located in individual cages during the first four weeks of pregnancy. The thermographic devices used were two FLIR ONE® cameras (FLIR, USA); for Mac-OS and Android, respectively, and images were recorded

OBJETIVES

Demonstrate that thermal imaging, obtained through a smartphone adaptable device, and combined with specific software is a quick, non-invasive alternative to reflect body temperature in pigs.

RESULTS

IMAGING

Both cameras and smatphones used provide images with enough quality to be analyzed by means of FLIR tools software, whatever the kind of image obtained. In the examples: image marking highest temperature (left) and "iron" image (right).





with an Iphone 6s Plus and a Samsung J5 smartphones. The images were analyzed using FLIR tools software (FLIR, USA).

The body temperature was measured using electronic digital thermometers (Quirumed, Spain).

Data were statistically analyzed using SPSS v.15 software (SPSS Inc, USA) and applying Spearman's correlations among all parameters cited above, as well as maximum temperature recorded by thermographic camera, considered significant when p<0.05.



Images of vulvar area and from all body showed very high correlation to rectal temperature (r=0.952,p<0.0001; r=0.811, p=0.027)









ENVIRONMENTAL CONDITIONS

DEVICE

Data from FLIR ONE for Mac-OS or for Android did not show correlation with any of the environmental factors recorded. Temperature ranked between 18°C and 27.5°C, humidity between 34% and 75% and brightness between 28 and 1300 lux.





DISCUSSION AND CONCLUSIONS

Several studies regarding thermographic health surveillance in pigs have been previously recorded, relating these images with rectal temperature and environmental factors with discrepant results in pigs and other livestock species (Sorensen et al., 2015, Ribeiro Caldara et al, 2014; Schaefer et al,2004). However none of them were performed using a FLIR ONE device for Mac-OS or Android. Up to our knowledge, it is the first time with this device. In this work we have found that both devices offered suitable results with high correlation between skin thermographic and rectal thermometric temperature. Our data set suggests that vulvar area is the most adequate thermal window but the improvement of correlation regarding any part of the skin did not justify to use this window.

Significance

P>0.0001 P=0.002

The images obtained with iPhone and FLIR ONE for Mac-OS showed higher correlation than those produced with Android device and smartphone.

REFERENCES

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In conclusion, thermographic skin scan offers a suitable tool to assess temperature in sows and gilts and reducing the stress of the animal, as well as the time needed to get the reading. The rectal temperature can be interpolated on the basis of the skin value attained by means of mathematical models.

ESPHM-0126