Use of Infrared Thermorgraphy in Animal Production

Welligton Conceição da Silva¹, Éder Bruno Rebelo da Silva², Raimundo Nonato Colares Camargo Junior³ and Luane Rarissa Miranda Cordeiro⁴

¹Medical Veterinarian, Master of the PPGSaúde and Animal Production / Federal Rural University of Amazonia (UFRA), Brazil
²Graduating in Agronomy at the Luterano University Center of Santarém (CEULS / ULBRA), Brazil
³Professor of the Federal Institute of Education, Science and Technology of Pará, Brazil
⁴Graduating in Agronomy / University Center Luterano de Santarém (CEULS / ULBRA), Brazil

Submission: May 21, 2019; Published: June 20, 2019

*Corresponding author: Welligton Conceição da Silva, Medical Veterinarian, Master of the PPGSaúde and Animal Production / Federal Rural University of Amazonia (UFRA), Belém, Pará, Brazil

Abstract

Infrared Thermography (TIV) is a non-invasive, safe technique that is capable of analysis and applicability in several areas. The objective of this study was to identify the importance of infrared thermography in production animals. In the study developed by Ferreira et al. (2011), TIV was used to evaluate the metabolic heat variations produced by chicks, the authors concluded that infrared thermography was able to efficiently detect the metabolic activity of juvenile birds. In goats, D’Alterio et al. (2011) evidenced unstable changes in the hull surface temperature flow, with the use of TIV. Graciano (2013) developed a study with pigs using the TIV and identified that the thermographic technique presents good efficiency for a pre-diagnosis of inflammatory changes and lesions, being able to be used as an aid, avoiding that reproducers are discarded. In view of the above, it is concluded that TIV presents applicability in different species of production animals, in addition, it is confirmed that TIV is relevant in the animal production area, because it functions as a body scanner, helping to show variations in the temperature of which may indicate metabolic changes or the onset of inflammatory processes.

Keywords: Cattle; Calf; Animal welfare; Thermogram

Introduction

In the area of Veterinary Medicine and Livestock, the aim is to develop improvement techniques in the field of agricultural sciences, benefiting medical clinics, veterinary sciences and scientific research [1]. Current technological advances provide a milestone in the emergence of new forms of diagnosis and prevention. The environment directly influences the animal development, with that, the search for early physiological changes are important. Non-invasively, infrared thermography shows an extremely precise technique capable of identifying changes in surface temperature and avoiding animal stress. This technique has functionality in production, company and laboratory animals [2]. Infrared thermography has been showing interest in several areas, as researchers consider advances in technique that is proving increasingly effective and accurate [3]. Infrared Thermography (TIV) is a non-invasive, safe technique that is capable of analysis and applicability in several areas. With the use of TIV, animals must be captured or restrained, avoiding stress and promoting animal welfare [4]. Among the advantages of using TIV, it can be used to prevent diseases, by detecting the increase in temperature before the appearance of the initial clinical signs, thus, it indicates the need to observe the evaluated animal; allows to identify physiological changes, besides being flexible for its application in areas of livestock farming [5]. In view of the above, it was aimed to point out the importance of infrared thermography in production animals.

Discussion

In the study developed by Ferreira et al. [6] used the TIV to evaluate the metabolic heat variations produced by chicks, the authors concluded that infrared thermography was able to efficiently detect the metabolic activity of juvenile birds. In goats, D’Alterio et al. [7] showed unstable changes in the hull surface temperature flow, with the use of TIV. Graciano et al. [8] developed a study with pigs using TIV and identified that the thermographic technique presents good efficiency for a pre-diagnosis of inflammatory alterations and lesions, being able to be used as an auxiliary, avoiding that reproducers are discarded. Nogueira et al. [9] in their study examined the mammary gland of dairy cows, the results showed differences in surface temperatures, varying according to the stages, being animals without inflammatory
The TIV has applicability in different species of production animals, in addition, it is confirmed that the TIV is relevant in the animal production area, as it functions as a body scanner, helping to show variations in surface temperature that may indicate metabolic or beginnings of inflammatory processes.

References
1. Rogalski A (2011) Recent progress in infrared detector technologies. Infrared Physics & technology 54: 136-154.
2. Luzzi F, Mitchell M, Costa LN, Redaelli V (2013) Thermogaphy: currents status end advances in livestock animals and in veterinary medicine. Brescia, a cura fondazione initiative zooprofilattiche e zootecniche pp.203.
3. Roberto JVB, Souza BB (2014) Utilization da termografia de infravermelho na medicina veterinária e na produção animal. J Anim Behav Biometeorol 2(3): 73-84.
4. Schaeffer AL, Cook NJ, Bench C (2012) The noninvasive and automated detection of bovine respiratory disease onset in receiver calves using infrared thermography. Research in Veterinary Science 93: 928-935.
5. Dunbar MR, Johnson SR, Rhyar JC (2009) Use of infrared thermography to detect thermographic changes in nule deer (odocoeles hemionus) experimentally infected with foot-and-mouth disease. Journal of Zoo and Wildlife Medicine 40: 296-301.
6. Ferreira VMOS, Francisco NS, Belloni M, Aguirre GMZ, Caldara FR, et al. (2011) Infrared thermography applied to the evaluation of metabolic heat loss of chicks fed different energy densities. Brazilian Journal of Poultry Science. Campinas 13(2): 113-118.
7. D’Alterio G, Casella S, Gatto M, Ganesella M, Piccione G, et al. (2011) Circadian rhythm of foot temperature assessed using infrared thermography in sheep. Czech Journal Animal Science, Prague 56(7): 293-300.
8. Graciano DE, Nääs AL, Garcia GR, Caldara RF (2014) Identification of pig arthritis using thermographic imaging. B Industr Anim Nova Odessa 71(1): 79-83.
9. Nogueira LM, Quirino CR, Jardim JG (2015) Infrared thermography of the bovine mammary gland to assist in the diagnosis and prognosis of mastitis. VII Fluminense Congress of Scientific and Technological Initiation.
10. Silva LKX, Sousa JS, Silva AOA, Lourenço Junior JB, et al. (2017) Testicular thermoregulation, scrotal surface temperature patterns and semen quality of water buffalo bulls reared in a tropical climate. Andrology 50(1): 1-10.
11. Silva WC, Martonano LG, Silva LKX, Rocha SLCS (2018) Nuances at Body Temperature from Scanner with Infrared Thermography. 22nd Seminar, Pibic, Embrapa.