Use of analysis and processing of digital images for evaluation and control of animal behavior in hot climates

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Abstract: The world production of meats is mainly concentrated in the countries with a hot climate. Among these countries, Brazil, considered "world's breadbasket", is located in the intertropical zone, with hot climates and presents lower thermal amplitude. Brazilian poultry is a leader in the production and export of broilers. Brazil has the second largest cattle herd in the world, has the largest commercial herd besides being the largest exporter of beef. Brazilian swine breeding, among the most advanced production chains in the world, occupy the position of fourth largest producer of pork in the world. Projections for Brazil's meat production sector indicate strong growth in the coming years, with countries in hot climates that will continue to sustain future growth in world meat production, ensuring food security in many countries. One of the factors responsible for the success or failure of animal production is the environment, defined by the sum of all physical and biological factors that affect animals. In these regions of hot climates, climatic factors are among the main limiting factors to the development of animal production, which may compromise animal welfare and productivity indices. Behavioral information can aid in the analysis of problems arising from environmental conditions unfavorable to animals, helping both decision making and the use of different environmental conditioning systems. The introduction of technification in the animal behavior evaluation processes, through the use of video cameras and image processing programs, allowed a better interpretation of the behavioral responses, quickly, accurately and non-invasively, gradually being used with greater frequency in the animal production sectors. The study of animal behavior assumes an important role in animal production, since, to rationalize the breeding methods, management, feeding and facilities techniques have been developed that interfere with animal behavior. In this context, the use of digital image analysis techniques, where the animals themselves are used as biosensors in response to environmental conditions, contributes to the analysis of animal behavior, and consequently also to the assessment of the internal environment of the production in hot weather.
Keywords: animal production, animal welfare, information technology

1 Introduction

World meat production is mainly concentrated in warm-weather countries, in tropical and subtropical areas, it is estimated that more than 50% of the world's total meat production areas (Renaudeau et al., 2012). Among these countries, Brazil, considered "world's granary", is located in the intertropical zone, with hot climates and presents a lower thermal amplitude, conditions that favor animal production.

Brazilian poultry is a leader in the production and export of broilers. Brazil is among the world's three largest

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