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Impact of Exposure to Cold on Layer Production  
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**ABSTRACT**

Infrared thermographic images were used to evaluate the effect of the exposure of layers to cold. In this trial, 540 Isa Brown® layers with an average age of 69 weeks were housed in a conventional layer house typically used in Brazil during a period of cold environmental temperatures. Environmental and heat-transference data were recorded between July 13-16, 2010. It was verified that layers under cold stress conditions lost four times more energy than the recommendations trying to maintain their body temperature. Due to their reduced feed intake capacity, hens are not capable of increasing the availability of the metabolic energy required to maintain their body temperature and egg production, consequently resulting in economic losses.

**INTRODUCTION**

During the last decade, there has been an increasing concern with animal welfare, particularly when associated with physiological responses used as indicators of animal comfort (Silva, 2001). Studies have determined a thermal comfort zone, within which livestock present higher and better production (Teeter & Belay, 1991; Barbosa Filho, 2007). However, the determination of this thermal comfort zone involves the knowledge on the many parameters, such as air temperature, air humidity, radiation, and wind, as well as their interactions (Paludo, 2002). It is difficult to determine the exact combination of these parameters that triggers heat stress, as it depends on the animal and specific environmental conditions (Azevedo & Souza, 2007).

Few studies were published in Brazil on the effect of cold on the behavior of layers, trying to identify the factors that cause cold stress, despite its tropical climate with wide temperature and humidity ranges (Nääs *et al.*, 1995). One of the main problems related to low environmental temperatures when poultry are maintained in open-sided poultry houses is the increase in feed intake, which is a natural response to try to increase the intake of the energy required to maintain essential body functions.

Infrared thermography (IRT) has been used in many studies to determine thermal responses on several animal species (Phillips & Heath, 2001). The IRT technique is not invasive and it is capable of detecting the heat emitted by a surface (Van Hoogmoed & Snyder, 2002). It has been used to provide a more precise image of surface temperature variations compared with other methods available for this type of evaluation. Therefore, this study aimed at evaluating the effect of the exposure of layers to cold on the cost of egg production using infrared thermography.