



## Concentrate intake and performance of dairy calves subjected to programs of supplementary lighting

Gledson Luiz Pontes de Almeida<sup>1\*</sup> Héli-ton Pandorfi<sup>1</sup> Fátima Baptista<sup>2</sup> Cristiane Guiselini<sup>1</sup>  
Marcelo de Andrade Ferreira<sup>3</sup> Vasco Fitas Cruz<sup>2</sup>

<sup>1</sup>Departamento de Engenharia Agrícola, Universidade Federal Rural de Pernambuco (UFRPE), 52171-900, Recife, PE, Brasil. E-mail: gledson.almeida@ufrpe.br. \*Corresponding author.

<sup>2</sup>Departamento de Engenharia Rural, Escola de Ciência e Tecnologia, Universidade de Évora, Évora, Portugal.

<sup>3</sup>Departamento de Zootecnia, Universidade Federal Rural de Pernambuco (UFRPE), Recife, PE, Brasil.

**ABSTRACT:** *This research aimed to assess Girolando calves' concentrate intake and performance when placed in shelters with distinct roofing materials and programs of supplementary lighting during the milk-feeding stage. In order to so, we used a completely randomized design with a 3×3 factorial arrangement, with three replications. Females Girolando calves (n=27) were assigned in individual shelters at random with 3 different roofing materials (fiber cement tile, recycled tile and thatched roofs) and subjected to three lighting programs (12, 16 and 20 hours). No interaction was observed between roofing material and lighting programs, whilst no significant effect (P>0.05) was observed among the roofing materials. The supplementary lighting, by providing greater light exposure time, has stimulated intake and therefore, significantly affected (P<0.05) the concentrate intake and performance of the animals that were subjected to 20 hours of light.*

**Key words:** animal performance, dairy cattle, light duration, weight gain.

## Consumo de concentrado e desempenho de bezerras leiteiras submetidas a programas de iluminação suplementar

**RESUMO:** *Essa pesquisa teve como objetivo avaliar o consumo de concentrado e o desempenho de bezerras da raça Girolando quando colocadas em abrigos com materiais de cobertura e programas de iluminação suplementar distintos, durante a fase de aleitamento. Para tal, nós utilizamos o delineamento experimental inteiramente casualizado em arranjo fatorial 3×3, com três repetições. As bezerras Girolando (n=27) foram distribuídas ao acaso em abrigos individuais, com materiais de cobertura distintos (telha de fibrocimento, telha reciclada e cobertura com palha), e sujeitas a três programas de iluminação (12, 16 e 20h). Não houve interação entre os materiais de cobertura×programas de iluminação, ao mesmo tempo que não foi observado efeito significativo (P>0,05) para os materiais de cobertura. A iluminação suplementar, proporcionando maior tempo de luz, tem estimulado a ingestão, e, portanto, apresentou efeito significativo (P<0,05) no consumo de concentrado e desempenho dos animais submetidos a 20h de iluminação.*

**Palavras-chave:** desempenho animal, bovino leiteiro, duração de luz, ganho de peso.

## INTRODUCTION

Calves' development is one of the most essential activities in dairy farming. It regulates production systems' feasibility, e.g., herd's renewal. More recently, it has been shown that fostering rapid growth early in life may have positive consequences on future milk performance (SOBERON et al., 2012) and survivability to second lactation. To obtain good results for dairy calf performance after weaning, animal consumption of adequate quantities of solid food is imperative before complete milk withdrawal (MILLER-CUSHON et al., 2013).

The behavior of calves is influenced by supplemental lighting at night with effect on feed

intake compared to animals without supplemental lighting (OSBORNE et al., 2007). Lactating cows have increased their milk production after being subjected to supplementary lighting (DAHL et al., 2000), in addition to stimulating weight gain in heifers. In studies by RIUS & DAHL (2006) heifers that were exposed to long photoperiods exhibited greater growth and earlier puberty compared to heifers that were exposed to short photoperiods. However, most dairy breeds suffer heat stress in hot regions with high incidence of radiation. When in a hot environment, shade provision can help animals to regulate their body temperature by reducing incoming thermal radiation (CAMPOS et al., 2005).

This research aimed to analyze Girolando calves' concentrate intake and performance placed