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PHOTOPERIODIC EFFECTS ON DIFFERENT CHARACTERISTICS OF DAIRY COWS

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ABSTRACT

Dairy producers are constantly searching out new management techniques to improve production efficiency and cash flow. Photoperiod management is a cost effective method to increase production in lactating cows. Photoperiod, or the daily sequence of light and dark, has dramatic effects on many physiological systems across animal species. Numerous studies confirmed that LDPP increases milk yield in lactating cows, and it is associated with decreased secretion of melatonin and increased secretion of prolactin (PRL) and IGF-1. LDPP also improved growth of neonatal calves from birth until 8 weeks of age. Relative to SDPP, heifers under LDPP had hastens puberty, leaner body at puberty, more mammary parenchyma growth, heavier and taller body conformation at parturition and more milk production in sequence lactation. Relative to LDPP, SDPP during the dry period increases mammary cell proliferation and decreases cell apoptosis. This enhanced mammary growth by SDPP during the dry period increases the number of functional mammary secretary cells at parturition and, in turn, increases the lactation performance. The SDPP effect on the mammary gland during the dry period is mediated by enhanced PRL signaling. Thus, photoperiod management can be used throughout the life cycle of the dairy cow.

KEYWORDS: Photoperiod, Milk Yield, Insulin-Like Growth Factor-I

ABBREVIATION KEY: LDPP=Long Day Photoperiod, **SDPP=** Short Day Photoperiod**, GH** = Growth Hormone, **IGFBP** = Insulin-Like Growth Factor Binding Protein, **PRL** = Prolactin