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奶牛采食调控理论与干物质采食量模型研究现状和分析

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Research Situation and Analysis on Feed Intake Theory and Dry Matter Intake Models of Dairy Cows

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摘要 对奶牛采食调控机理进行分析不仅有助于理解影响采食量的因素, 同时也能构建与发展奶牛干物质采食量模型奠定基础。在探究奶牛采食调控理论的基础上, 总结了国际上近20年来构建的奶牛干物质采食量模型, 主要包括经验模型、机理模型及半机理模型, 深入分析了一些典型模型构建的背景、特点及它们之间的相互关系。目前, 干物质采食量预测仍以经验模型为主, 而机理模型参数比较复杂且不易获得, 但是作为机理调控的量化描述有重要的研究意义, 半机理模型综合了机理模型及经验模型的特点, 反映了模型发展的新趋势, 但具体预测效果还需要进一步验证。本文通过对干物质采食量模型进行总结与分析, 为开展适合我国奶牛干物质采食量模型研究提供了新思路。

关键词: 奶牛 干物质采食量 调控理论 模型

Abstract: Analyzing the feed intake mechanism for dairy cows not only helps to understand the factors impacting feed intake, but also lays a foundation for building and developing dry matter intake (DMI) models for dairy cows. Based on the investigation of feed intake theory for dairy cows, this paper summarized DMI models for dairy cows which were built by international in the past 20 years, mainly including empirical, mechanistic and semi-mechanistic models. Meanwhile, the paper also deeply analyzed the building background, characteristics and interrelation of typical models. At present, the empirical models are mainly used to predict DMI. Even though parameters are complex and difficult to obtain, the mechanistic models as the quantitative description of feed intake regulation have an important significance. Semi-mechanistic models integrate the characteristics of mechanistic models and empirical models, and reflect a new trend of models' development. But the concrete prediction effects of semi-mechanistic models still need further verification. Based on the analysis and summary of DMI models, this paper provides a new idea for carrying out the research in DMI models for dairy cows in China.

Keywords: dairy cow, dry matter intake, regulation mechanism, model

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