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Viewpoint Article

Lifestyle Bioengineering via Scheduled Intake: Bridging Animal Agriculture to Human Medicine

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Abstract

Ruminant discoveries help construct a promise to develop family programs on timing of eating to improve cell metabolism and overall body health. In light of the increasing concerns on obesity, diabetes, cardiovascular complexities, and cancer, public education must adopt optimum times of nutrient intake times over the 24-h period. Such a guideline would include avoiding large evening and night meals, consuming early post-exercise breakfast, and distributing frequent meals during morning and early afternoon hours. Scheduling of food intake is a feasible approach to bioengineer lifestyle to improve life quality in the postmodern era.

Keywords: Life quality; Timing of intake; Ruminant; Human health

Introduction

This policy article aims to increase public awareness of the untraveled highway of 'eating scheduling and timing' to optimizing integrative metabolism and health of the man in the new postmodern era. The most recent discoveries in comparative livestock, rat and human nutritional physiology contributed to the emergence of the novel science of 'chronophysiology management'. This science is concerned with circadian rhythms of cell metabolism and how they should be synchronized with the external factors including but not limited to timing of eating and photoperiod [1-4].

Discoveries, Intuitions and Discussion

Recent findings have revealed that ruminants as irreplaceable working models with sophisticated metabolism and physiology respond dramatically to timing of eating [5,6]. Dairy cows fed in evening *vs.* morning under thermoneutral and controlled environments produced greater milk energy and in some cases consumed greater feed that is a sign of favorable metabolic health [6,7]. These findings were substantiated in following studies [8]. In addition, we do know that glucose tolerance and insulin sensitivity in human are impaired as day leaves for night [9,10]. The fact that evening fed cows produce more milk and may eat more feed stems from their considerably higher metabolic turnover of peripheral tissues, when compared to human. However, the unique brain metabolism in human must be contemplated differently when aiming to interpret animal data for interventions in human metabolism and medicine.

All in all, the science generated mainly over the last few decades established that when to eat matters more than much for public health. Insulin is not required very much in high-producing cows since they need not to deposit but instead to secret nutrients out of the body. In other words, insulin action in high-producing ruminants is rather restricted to nutrient oxidation in fuelling splanchnic tissue's energy expenditure. In contrast, human metabolism is greatly dependent on and responsive to insulin all the time. Thus, in view of the evolutionary human metabolism, less glucose and thus less insulin have been required overnight when the body must rest and not highly metabolize. As a result, human has not evolved to develop a high-capacity insulin-dependent glucose and amino acid metabolism during evening and night times. As such, should food be greatly supplied overnight, when the body is not prepared to manage, impaired intermediary and integrative metabolism can expectedly occur.

Implications

The integrative public education must concentrate on signifying the importance of scheduling and timing of food intake to ensure that internal physiology is properly managed to be adequately synchronized with the external environment. This bioengineering approach can assure that people are cognizant and can feasibly practice how prevention is superior to treatment in overcoming metabolic disorders and various types of cancer. It is time to make science workable for all.

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