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Body reserves, pregnancy, parturition and appetite: vigorous management of food intake

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Objective

This article discusses how body fat and other internal energy reserves in relation to pregnancy and parturition develop mechanisms to regulate appetite and food intake. This is of rising crucial importance as obesity continues to depress life quality in many parts of the world.[1–4]

Interdisciplinary discussion

Body weight

Nutrient demands rise as body weight or more accurately as metabolic body weight increases. Growth also affects appetite and food intake. Unlike more metabolically mature adults that have already achieved the adult body weight, first-time mothers are still growing. Sustained growth needs a balanced profile of nutrients, notably amino acids and energy. Growth will, thus, be expected to affect food intake response to lifestyle and nutritional regimens. Body fat is a key factor controlling food intake. Animals and human control body weight by controlling body fat. According to the lipostatic theory, increased body fat can depress food intake. Such an effect may be mediated via leptin secreted by adipocytes and may be involved in food intake regulation.[5–7]

Body fat

Animal models studies suggest that body condition score, a visual indicator of body fatness, can improve food intake prediction models that are based on body weight. This supports the original lipostatic theory. Previously, body fat, particularly in abdominal regions, had been thought to limit the stomach capacity and reduce food intake. For instance, rumen contents in ruminants were negatively related to the abdominal fat size post-slaughter. Such studies, however, were unable to prove if the inhibitory impact of body fat was mediated mainly by physical rather than metabolic constraints. Even when a highly digestible diet is fed, food intake is lower in obese models, suggesting that chemical constraints linked to body fat (e.g., leptin) may in part explain the lipostatic theory.[8]

Maintenance needs

Maintenance nutrient requirements are about 10-20% lower in first-time mothers compared to more metabolically mature peers. The lower maintenance requirement would lower maintenance nutrient intake. Thus, at comparable nutrient expenditure and milk secretion, first-time mothers would be expected to consume about 10-20% less food than would more mature mothers. It must be noted that all mothers give their first birth at comparable ages.[7,8]

Peripartal transition

Lactating mothers experience a dip in food intake during their transition from late pregnancy into parturition and early weeks postpartum. The minimum food intake expectedly occurs at parturition. The decline in food intake begins even long before the last few weeks of pregnancy. The energy concentration of the mother's food has a significant impact on intake response to pregnancy and parturition. For instance, the decreased food intake in late pregnancy is more pronounced at higher compared to lower dietary energy levels. This may be due to stronger metabolic effects of high-energy diets on food intake.[7]

Parity

Parity or the number of births may influence postpartal patterns of food intake. First-time mothers may tend to exhibit a slow rise in food intake over about 15 weeks postpartum, when compared to more metabolically mature mothers. After the peak, food intake in first-time mothers remains almost constant but in mature mothers, food intake may decline continuously. The differences may stem from the different patterns of milk secretion and indeed age or physiological standing at the same age. Multi-birth mothers may have a higher peak of milk secretion followed by a more dramatic decline towards the end of lactation. First-time mothers, in contrast, may have more consistent milk yield patterns throughout lactation. As a result, food intake curve may change accordingly.[8]

Milk secretion and food intake regulation

It is a critical question whether, and to what extent, food intake pushes milk secretion or milk secretion drives appetite and food intake. Animal models studies suggest that milk production drives food intake. This is partly based on the increased food intake due to increased milk yield in dietary modified cases. The application of milk enhancers in early lactation stimulates the mammary nutrient uptake and milk secretion before increasing food intake. During the negative nutrient balance, lactating mothers draw energy from their body reserves (fat, protein, calcium) to meet prolonged increased nutrient requirements. This suggests that the elevated demand for nutrients may drive the mother to increase appetite and food intake. It must be noted that the degree to which milk secretion stimulates food

intake varies across lactation. At higher production levels, food intake response may be more pronounced. The hypothetical positive impact of a given dietary regimen (such as appetizers and energy intake enhancers) on food intake is expected to be of greater magnitude in early and highly lactating mothers. Research is much required to elucidate how body fat and internal reserves in relation to pregnancy and parturition develop multiple mechanisms towards rhythmic and fitting regulation of appetite and food intake. The latter two must not be considered the same.

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Conflict of interest

Author declares that there is no conflict of interest.

References

1. Nikkhah A. Lifestyle Bioengineering via Scheduled Intake: Bridging Animal Agriculture to Human Medicine. *Aust J Biotechnol Bioeng*. 2015;2(3):1045.
2. Nikkhah A. Demolishing Obesity via a Circadian Cutting-Edge Public Science. *J Obesity*. 2015;1(1):008.
3. Nikkhah A. Living on Healthy Rhythms to Overcome Cancer: Birth of a Public Therapeutic Science. *J Nutr Therap In Press*. 2015.
4. Nikkhah A. Nutritional Chiefdom. *J Nutr Health Food Eng*. 2015;2(5):00072.
5. Nikkhah A. Improving Human Health through Optimizing Food Intake and Exercise Time Management: A Real-World Science. *J Nutr Health Food Eng*. 2015;2(5):00070.
6. Nikkhah. Diabesity and Lifestyle. *Curr Res Diabetes Obes J*. 2015;1(1):CRDOJ.MS.ID.555552.
7. Nikkhah A. *New Theories of Ruminant Feed Intake Regulation (In Persian)*. Tehran & Zanjan: Jahade-Daneshgahi Publishers; 2014.
8. Nikkhah A. *Time of feeding an evolutionary science*. Germany: LAP LAMBERT Publishing, GmbH & Co. KG; 2011.