

Effects of different meat species and their fractions on postprandial behavioral thermoregulation in mice

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Background and Objectives: In Traditional Chinese medicine (TCM), most foods including meats are classified into five 'natures' based on the feeling evoked after consumption. Foods that evoke a sense of warmth are classified as 'hot' and 'warm', whereas those that evoke a sense of coolness are classified as 'cold' and 'cool' natures in the order of reducing potency. Foods that exert neither effect are classified as 'neutral' nature. For instance, beef fat, chicken, and lamb are considered 'warm', while horse meat, chicken fat, and pig fat are considered 'cold' or 'cool' by nature. According to TCM, body cooling foods help in reducing heat, while body warming foods help in expelling colds and warming the meridians. Hence, in eastern countries, understanding the five natures of food is believed to guide and prove a person's healthy dietary habits. Among foods, meat accounts for a large proportion of the daily human food intake because of its nutritive value and rich taste. Therefore it is important to understand the five natures of meat. However, in TCM, food is classified into five natures based on thousands of years of experience alone without any scientific data to support it. Thus, the objective of this study was to establish an experimental system to provide a scientific method for evaluating the five natures in different species of meat. To obtain more credible data on the five natures of meat, in accordance with the behavioral thermoregulatory performance, the preferred temperature changes were observed.

Materials and Methods: Freeze-dried meat, defatted meat, and extracted fat were prepared from chicken, beef, pork, lamb, deer, and horse meat. Each meat type was used to prepare feed according to standard AIN-93G feed, which was divided into two groups, one containing freeze-dried meat and extracted fat (FD group) and the other containing defatted meat and 'neutral' corn oil (DF group). The post-prandial behavioral thermoregulation was observed, to determine the temperature preferred by the mice. Briefly, each group of mice (ICR male mice (n=8-12), 6-8 weeks of age) was fed different species of FD or DF feed (2 g). After feeding for 80 min, the mice were individually placed into an elongated chamber (10×90 cm) equipped with a temperaturegradient floor (approximately 10-38°C). Mice movement was video-recorded from 30 to 120 min after consumption and their behavior was analyzed. The temperature of the floor where each mouse stayed for the longest duration was regarded as the preferred temperature.

Results and Discussion: Among the FD groups, mice that consumed chicken, pork, and horse meat feed preferred higher temperatures compared to the other meat species, suggesting that consuming chicken, pork, and horse meat feed evoked a feeling of coolness in the mice. Among the DF groups, only mice that consumed horse meat feed preferred significantly higher temperatures, suggesting that among lean meats, only horse meat feed evoked a feeling of coolness in the mice. The results of chicken fat, pork fat, and horse meat from this experimental system were consistent with the cool or cold nature which have been classified according to the experience of TCM. Thus, this experimental system might be useful in providing evidence for evaluating the five natures of meat in TCM, particularly the 'cool' and 'cold' categories, after consumption.

Key words: TCM, Natures, Thermoregulation, Temperature