Sports Nutrition in Japan: from the Past to the Future

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Summary

The Tokyo 2020 Olympics and Paralympics finished on 5 November 2021. A total of 870,000 meals were provided in the main dining facility during the events. Sports nutrition research in Japan began before the previous Tokyo Olympics, which was held in 1964. A book about sports nutrition in Japan had already been published, in 1949. A number of previous studies have examined nutrition among Olympic athletes, and influential research on sports nutrition in Japan includes a series of studies on sports anemia. This series covered basic research into the mechanisms of sports anemia through to the prevention of sports anemia. However, anemia among athletes remains an important issue. In Japan, an accreditation system for sports dietitians was established in 2007, and a scientific association for sports nutrition was established in 2004. However, the connection between basic research and practice remains a substantial problem.

Key Words

food provision at Olympics, sports anemia, sports dietitian

The Tokyo 2020 Olympics and Paralympics finished on 5 November 2021. The Olympic events were postponed because of the COVID-19 pandemic and the scale was smaller than initially planned. Table 1 shows a summary of food provision at the Olympics according to a report from the Tokyo 2020 Olympic Committee (1). During the Olympics, many photos were shared by athletes via social networking services. These messages indicated that most athletes enjoyed the food at the athletic village, although they had fewer opportunities to eat outside the village. In the previous Tokyo Olympics held in 1964, there were three dining areas (two for men and one for women) in the athletic village. In total, there were 1,230 seats for diners. In addition, 6,530 meals were provided each day, which were designed to provide approximately 6,000 kcal per day. Compared with the Tokyo 1964 Olympics, the number of menu options and meals increased at the Tokyo 2020 Olympics. Not only cultural differences, but also differences in health, religion, and dietary principles were taken into consideration in the menu planning process. Recyclable paper tableware was used at the 2020 Olympics, whereas chinaware was used in the 1964 Olympics. A major change between the two Tokyo Olympics events was the consideration of nutrition in addition to providing hearty meals.

History of sports nutrition in Japan

To the best of the author’s knowledge, the oldest book on sports nutrition in Japan was part of a series of physical education books titled “Nutrition,” published in 1949 (2). This book describes basic nutrition and includes information about energy fuel during exercise, and the relationship between exercise and each nutrient. Although this was a relatively short publication comprising 33 pages, the contents are similar to current books on sports nutrition.

The beginning of nutritional support for athletes in Japan is unclear. However, according to the 5-y plan for improving the performance of athletes produced for the Tokyo 1964 Olympics, a carefully planned menu for athletes including more than 5,000 kcal and nutritional supplements was provided at the training camps (3).

The influential early research series on sports nutrition conducted in Japan was the first study of sports anemia. The research group responsible for the series was led by Yoshikawa, and included many researchers from medicine and sports science. This research began with human, dog and rat studies of osmotic resistance in erythrocytes (4) and continued for more than 10 y. Yoshimura summarized the studies, and defined the anemia caused by intense muscular exercise as “sports anemia” (5). In addition, another study reported that a dietary protein intake of 2 g/kg/d was required to prevent an athlete undergoing vigorous training from developing sports anemia (6). These studies included observational studies, experiments to clarify the underlying mechanisms, and intervention studies in humans. Some of these studies were conducted in training camps of college athletes. Although no previous reports have described the application of these studies to practical situations, this series of studies ranged from basic research to applied research. However, anemia among athletes still frequently occurs and remains a serious problem.

Sports dietitians

Sports dietitians in Japan have been accredited by both the Japan Sports Association (JSPO) and the Japan Dietetic Association (JDA) since 2007. The accreditation process for sports dietitians is undertaken in two stages. The basic accreditation course includes 150 h of coaching and conditioning lectures and practice.
This course is the same as courses undertaken by other candidates working in other sports-related fields (e.g., coaches, athletic trainers, medical doctors, allied health professionals, and sports managers). After the examination for the basic course has been passed, the specific course for sports dietitians includes 76.5 h of lectures and practical sessions and 40 h of internship, followed by a final examination. As of 1 October 2021, there were 432 sports dietitians in Japan.

Japan Sports Nutrition Association

The Japan Sports Nutrition Association (JSNA) was launched on 20 October 2004 as a focus group for dietitians participating or interested in sports nutrition. The association developed gradually. By 2013, the initial focus group had grown into a large professional and scientific organization with approximately 1,400 members. As of 31 May 2022, the association had 2,023 members. The vision of the JSNA is to promote improvement of athletic performance and health for all active and athletic individuals through research in sports nutrition, education, sharing of scientific resources and excellence in practice by qualified professionals. A major focus and strength of JSNA is collaboration between researchers and practicing dietitians. This collaboration helps practicing dietitians access scientific evidence more easily, and also helps researchers understand real-world sports nutrition questions from athletes. In the early period, most of the journal articles published by the JSNA were studies conducted in the laboratory. The number of reports of practices conducted by sports dietitians has increased in recent years.

Future research

Conducting research on sports nutrition can be difficult. Most sports nutrition studies have been conducted in laboratories, and have tended to examine healthy active individuals or college athletes rather than directly examining elite athletes. In addition, sports nutrition researchers are often required to use surrogate markers as outcomes, whereas the final goals are typically to achieve the best score or time, or to win games. However, it is difficult to recruit athletes as subjects for studies, particularly those competing at high levels. In sports nutrition research, researchers must control the experimental conditions as much as possible. Moreover, the best scores or times and the ability to win games are affected by various factors in addition to nutrition. From the perspective of practice, athletes and the training situation differ from experimental subjects in basic research. Unlike experimental situations, in practice it is difficult to control various conditions including the intake of all foods and the content of training. In addition, the training season continues for a long period rather than a few weeks or months, which tends to be the duration of experiments. Thus, there are gaps between laboratory studies and practice.

Connecting basic research and practice will be difficult if the same approaches are applied in sports nutrition research. Recently, the number of studies using approaches that are more similar to athletic practice in the field has been increasing. Stronger connections between research and practice will be required to prevent health problems and improve performance among athletes.

Disclosure of state of COI

No conflicts of interest to be declared.

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REFERENCES

1) Tokyo 2020 Olympic Committee. 2021. Reflection for Tokyo 2020. https://www.tokyo2020.jp/ja/image/upload/production/%E6%9D%B1%E4%BA%AC2020%E5%A4%A7%E4%BC%9A%E3%81%AE%E6%8C%AF%E3%82%8A%E8%BF%94%E3%82%8A%E3%81%AB%E3%81%A4%E3%81%84%E3%81%A6.pdf (accessed 4th April, 2022) (In Japanese).


Table 1. Food provision at the Tokyo 2020 Olympics.

<table>
<thead>
<tr>
<th>Characteristics of menu</th>
<th>Main dining</th>
<th>Casual dining</th>
<th>Grab and go stations (four locations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of menu items</td>
<td>700</td>
<td>200</td>
<td>19</td>
</tr>
<tr>
<td>Total number of meals</td>
<td>870,000</td>
<td>60,000</td>
<td>50,000</td>
</tr>
<tr>
<td>The number of seats for diners</td>
<td>3,000</td>
<td>280</td>
<td></td>
</tr>
<tr>
<td>Paralympics</td>
<td>2,400</td>
<td>250</td>
<td></td>
</tr>
</tbody>
</table>
| Foods were provided as buffet-style options in nine main categories: Japanese, World, Asian, Halal, Vegetarian, Gluten free, Pizza and Pasta, Salad, and Bread. In the Japanese category, foods were divided into eight groups, and food groups were provided in blocks by week. The menu included onigiri (rice balls), noodles, grilled food on a plate, grilled food on skewers, and fruit. Sandwiches, yogurt, whole fruit, coffee and tea.
Tokyo, Japan (In Japanese).