Catering for the Athletes Village at the Sydney 2000 Olympic Games: The Role of Sports Dietitians

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This article describes the development, analysis, and implementation of the menu available to athletes and patrons in the main dining hall of the Athletes Village at the Sydney 2000 Olympic Games and the significant role of sports dietitians in this process. Menu design and development was informed by focus groups, literature reviews, and food-preference surveys of athletes. The final menu was also assessed by an expert panel of Australian sports dietitians. A custom-designed database (Foodweb) was developed to enable dietary analysis of food-production data and creation of point-of-choice nutrition labels. Dietitians assisted with quality assurance testing and training of catering staff. Athletes surveyed in the main dining hall (N = 414) agreed that the menu contained sufficient variety and adequate meat, pasta/rice, vegetable/salad, fruit, and snack items. Sports dietitians played a significant role in ensuring that the menu met the needs of athletes from a range of differing cultural and sporting backgrounds. Dining-hall patrons provided positive feedback and few complaints about the overall dining experience. The information presented in this report can help future caterers and dietitians with the planning and provision of suitable food for athletic performance at an Olympic Games.

Keywords: dietician, menu, food service

Competing at the Olympic Games is the highest achievement for most of the world’s elite athletes. Optimal dietary intake is a key contributing strategy to ensure peak performance (American Dietetic Association & Canadian Dietetic Association, 1995; Burke, Kiens, & Ivy, 2004). Food provision in the main dining hall at the Olympic Games is challenging because the participating athletes have a wide range of energy and nutrition requirements and vast differences in food preferences because of both cultural and religious diversity (Cummings, Crawford, Cort, & Pelly, 2006). A smaller proportion of athletes might also require a range of therapeutic diets to manage food allergies or intolerances or other clinical

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conditions. These complexities, combined with the need for large-scale food provision using temporary kitchen and dining facilities and a substantial number of casual staff who need to be oriented to new cooking procedures and security protocols, make Olympic dining-hall catering an onerous challenge.

Detailed documentation on catering requirements, protocols, and food intake from past Olympic Games is difficult to obtain. The large-scale, lucrative, and commercial nature of the catering-tendering process for each Olympic Games discourages disclosure of detailed information. This commercial-in-confidence information is the intellectual property of the tender-winning catering supplier and contributes to their capacity to develop an informed and competitive tender for subsequent games (Pelly, 2007). Limited information about catering is available from official reports published by the organizing committee after completion of each Olympic Games. These reports vary in depth of content and focus primarily on the culinary side of catering.

Historically, early Olympic catering was primarily concerned with the dietary preferences of officials, dignitaries, and sponsors rather than those of the athletes, and dietitians had little or no input into the design of the menu (The Atlanta Committee for the Olympic Games, 1997; Berry et al., 1949; Los Angeles Olympic Organizing Committee, 1984; Organising Committee for the Games of the XXth Olympiad Munich 1972; Organising Committee for the Olympic Games, 1976). The official report from the 1984 Los Angeles Olympic Games was the first to suggest that it would be useful to include dietary specialists in the menu preparation (Los Angeles Olympic Organizing Committee). According to the report, swimmers and runners had complained about the lack of low-fat food items on the menu. By the 1996 Atlanta Games, the Food and Beverage Department reported that their primary objective was to supply food that was nutritious and conducive to sports performance (The Atlanta Committee for the Olympic Games). For the first time, there was mention of a high-starch, low-fat menu with one vegetarian option at each meal period. Nonetheless, anecdotal comments by Australian athletes after the Atlanta Games suggested that the menu still failed to meet their need for low-fat, high-carbohydrate foods (Pelly, 2007).

Caterers are usually concerned with meeting the needs of their customers to ensure a profit from the business (Reichler & Dalton, 1998), but budget constraints at the Olympic Games are based on how to spend allocated funds. There has traditionally been little cooperation between catering staff and dietitians involved with food service, particularly at the level of catering policy (Hughes, Harvey, & Heywood, 1997). This can result in the provision of food that is inappropriate and unappealing to the athletes. A recent survey at an international elite-level competition showed that athletes rated nutrient composition above familiarity, visual appearance, and smell when making a food selection (Pelly, King, & O’Connor, 2006). Taste is also a major determinant of food choice (Buscher, Martin, & Crocker, 2001; Hess, 1997; Sproul, Canter, & Schmidt, 2003) and can influence an athlete’s intake before competition. This suggests that a cooperative relationship between dietitians and catering is essential to produce a menu that meets both dietary and taste requirements.

This article describes the design, development, and analysis of the main dining-hall menu implemented in the Athletes Village at the Sydney 2000 Olympic Games and the significant role of sports dietitians in this procedure. The steps
involved in this process are described in the following sections and are represented diagrammatically in Figure 1.

**Overall Menu Development and Philosophy**

In 1998, the Australian catering corporation Spotless Services Limited, in collaboration with the Aramark Corporation (Aramark/SSL), won the food-service tender for the Athletes Village at the Sydney 2000 Olympic Games. The challenge was to develop a suitable menu for 10,651 athletes (4,069 women and 6,582 men) representing 199 nations competing in 300 events in 28 sports. This involved developing the menu for the main dining hall and a secondary outdoor service area named casual dining. The primary objective was to present a menu with strong authentic taste appeal while providing extensive choice for the diverse performance and special dietary needs of the patrons. Advice was sought from an

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**Figure 1** — The steps involved in the process of designing, analyzing, and implementing the main dining-hall menu for the Athletes Village, Sydney 2000.
Catering for the Athletes at the 2000 Olympics

An expert panel of 10 Australian sports dietitians regarding the performance needs of athletes and the wide-ranging religious, cultural, and therapeutic dietary requirements that would need to be reflected in the design of the menu. Menu items highlighting traditional and multicultural Australian cuisine were included to enrich the host-country experience. A 10-day cycle was used to minimize “menu fatigue” and repetition. Authenticity was maintained by offering traditional dishes using standard recipes rather than modifying ingredients to minimize fat or alter macronutrient composition. McDonald’s, being one of the major sponsors of the Sydney 2000 Olympic Games, operated two outlets offering a limited range of their standard retail menu in the Athletes Village. One outlet was located at the casual dining area; the other was positioned centrally within the main dining hall.

Performance Requirements

A survey of various Australian athletic groups was undertaken to research current food trends and preferences in this population. The first author designed the survey in consultation with the caterers, with feedback from expert sports dietitians. Participants rated their frequency of consumption (5-point scale of never to always) of proposed menu (meal and snack) items before competition (preevent) and during recovery. Specific hot food menu items (e.g., salmon with pesto, mushroom risotto) were also trialed by the caterers at sporting camps, and athletes were interviewed to obtain feedback on their suitability. A total of 104 athletes (64% female, 36% male) participating in rowing, weightlifting, tennis, hockey, track and field, diving, and equestrian and water polo responded to the survey. Most (75%) reported consuming a low-fat diet, with high-carbohydrate menu items consumed at least some of the time at both lunch (64%) and dinner (73%). A preference for low-fat, high-carbohydrate items was supported by athlete interviews. Consequently, the menu included a wide variety of low-fat dishes with at least one low-fat alternative for almost every type of traditional or authentic menu item at each meal period. To support the preparation of lower fat items, particular cooking equipment and techniques (steaming, poaching, dry baking, and broiling) were incorporated into overall food service and menu plan. The all-day menu included:

- Low- or reduced-fat dairy products, cold meats, dressings, and spreads
- Steamed vegetables prepared without added fat at lunch and dinner
- An adequate selection of items high in carbohydrate
- “Fun” carbohydrate-based items such as pizza and pasta, in both traditional and reduced-fat varieties

Cultural Requirements

Cultural values have one of the greatest influences on food choice (Nestle et al., 1998). Anecdotal feedback from the 1996 Olympic Games in Atlanta suggested that there was a higher than anticipated demand for traditional foods from the African, Asian, and Eastern European nations (Pelly, 2007). We conducted four focus groups with African and Eastern European migrants residing in Australia to
obtain information about their traditional dietary intake, staple menu items, and intake of nontraditional cuisine. This was supported by a review of published material from a range of resources (published articles, books, and the Internet) to inform the menu design for patrons from these regions. As a result of the focus groups and literature review, our recommendations to the caterer suggested including breakfast staples (e.g., cassava, maize, rice) and traditional soups and stews for African competitors and a variety of sausages, cheeses, potato dishes, pork, and thick soups for Eastern Europeans. To improve the authenticity of the African component of the menu, the caterers established a relationship with a number of African restaurants in the Sydney metropolitan area who supplied both traditional African and halal (ritually fit according to Islamic law) cuisine to the village. Substantial halal hot food items were included at each meal period and included 23 items (66% of total hot items) available at lunch and dinner and 14 items (74%) at breakfast. Because of the strong Asian cuisine influence in Australia, experienced Japanese and Korean chefs were easily recruited and traditional Asian menu items including kim chi and miso soup were incorporated. Because of low demand and the difficulty of providing an accredited kosher menu in the temporary kitchen setting at the Village, specific prepacked meals and kosher food items were purchased from an accredited supplier. These were available on request.

**Special Dietary Requirements**

At the menu-development stage, catering staff identified vegan and gluten-free diets and the wide array of specific food allergies and intolerances as a significant challenge. To simplify provision of gluten-free diets, the caterers incorporated gluten-free thickeners in wet dishes when possible to increase the choice of gluten-free items. Because of the high risk of anaphylactic shock associated with inadvertent ingestion/contamination (especially nut) of allergens in extremely sensitive individuals, high-risk allergens (e.g., peanuts, peanut oil) were removed from all recipes and not brought into the kitchen or dining facility. This policy reduced, but did not eliminate, the risk of an adverse event. The identification of allergens in commercial products was at the discretion of the supplier. The menu incorporated one specialized vegan choice at lunch and dinner (e.g., chickpea cakes with black bean salsa). An additional 11 hot items were classified as vegan for each meal period, with six vegan items available at breakfast.

To ensure that patrons could make an informed choice from the menu, recipe ingredients from fresh or commercial products were collated and displayed on a point-of-choice nutrition card for each menu item (Figure 2). Unique icons representing energy, carbohydrate, protein, and fat were developed for easy recognition on the labels. The icons were designed to explain the predominant function of the nutrient they represented.

**Dietetic Review of the Menu**

An expert panel of seven sports dietitians representing the Institutes of Sport in Australia reviewed the Olympic menu to assess its suitability for elite athletes and compliance with cultural, religious, and therapeutic diets. Recommended modifi-
In addition to the previously mentioned menu modifications, any individual with special dietary requirements could obtain dietetic support from a nutrition kiosk located in the dining hall. Kiosk dietitians were available (7 a.m. to 8 p.m.) to help patrons select appropriate food items from the menu. On a case-by-case basis, caterers agreed to provide specific items recommended by kiosk dietitians to help individuals with more extraordinary needs that were typically associated with particular intolerances or specific clinical conditions.
Dietary Analysis of the Menu

Dietary analysis of the menu was conducted using a custom-designed database (Foodweb; Figure 3) developed with the software program Filemaker Pro 5.0v1 (Filemaker, Inc., USA). A dietitian experienced in dietary analysis matched ingredient items to foods from the AUSNUT (Food Standards Australia and New Zealand, 1999) database. Items not listed in AUSNUT were matched to the USDA Nutrient Database for Standard Reference (Release 13, November 1999). One of the features of Foodweb was that it was closely linked to the caterer’s recipe database so that the analysis would reflect changes to the preparation of foods dynamically (for example, alterations in ingredient availability). Ultimately, 2,994 items, consisting of 1,447 ingredients and 1,547 recipes, were imported into Foodweb for analysis. A total of 769 items were used in the main dining menu design.

A nutrient-retention factor obtained from AUSNUT was applied to raw ingredients when applicable to reflect cooking-induced changes in nutrient composition. Moisture change in recipes was also accounted for by linking to the AUSNUT database, and this estimate could be revised for particular recipes if appropriate. In addition to these features, the database was used to generate the point-of-choice nutrition labels (Figure 2) and to classify dishes based on macronutrient content and special dietary needs. Kiosk dietitians used a function in Foodweb to design and print athletes’ meal plans. The meal plans incorporated the macronutrient icons and included the total energy and macronutrient content per meal and in total (Figure 4).

Final Design of the Menu

The complete menu included 1,500 items (345 recipes) rotating over the 10-day menu cycle. This included hot items that were available at distinct meal periods (breakfast, lunch, dinner, and supper) and rotated over the 10 days, cold items that were available all day but rotated on a daily basis (daily change), and items that were available over 24 hr every day (no rotation). The final menu included a substantial proportion of high-carbohydrate (>15g/serving) and high-protein (>10 g/serving) menu items (25% and 17%, respectively). Two thirds (67%) of all menu items were low in fat (<10 g/serving).

A breakdown of the menu design provides an insight into the nutritional value of the menu based on food groups and macronutrients. Table 1 shows the number of choices in each meal period based on food-group classification. Menu items containing contributions from a number of food groups were categorized based on the predominant food group.

Defining the “Standard Serve”

A preliminary evaluation of recipes for serving size, appearance, and taste was conducted by the caterers in July 2000. A total of 152 menu items were evaluated by weighing them in grams using the designated serving utensil (e.g., basting spoon) leveled to remove extra food. Weights of each standard serve were recorded in triplicate to the nearest gram and used to calculate the nutritional composition
Figure 3 — The “current recipe” page in the Foodweb database. Features include food ID, ingredient name, quantity in grams, individual retention description, and moisture change for the whole dish; individual and total macronutrient breakdown; recipe method; and current status (e.g., finished). A comment box is included for the caterer.
Figure 4 — An example of an athlete’s meal plan incorporating macronutrient icons. Note. Actual athlete meal plans have not been provided to ensure participants’ privacy.
<table>
<thead>
<tr>
<th></th>
<th>Bread/Cereals</th>
<th>Meat and alternative</th>
<th>Dairy</th>
<th>Fruit</th>
<th>Vegetable/Salad</th>
<th>Other&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Beverages&lt;sup&gt;c&lt;/sup&gt;</th>
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</thead>
<tbody>
<tr>
<td>Hot food items (rotational menu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>breakfast</td>
<td>6</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>lunch</td>
<td>13</td>
<td>11</td>
<td></td>
<td></td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>dinner</td>
<td>13</td>
<td>11</td>
<td></td>
<td></td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>supper</td>
<td>10</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subtotal, n (%)</td>
<td>42 (47)</td>
<td>38 (42)</td>
<td></td>
<td></td>
<td>10 (11)</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Cold food items (all-day menu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26&lt;sup&gt;d&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>Total, n (%)</td>
<td>68 (36)</td>
<td>48 (25)</td>
<td>13 (7)</td>
<td>20 (11)</td>
<td>40 (21)</td>
<td>67</td>
<td>23</td>
</tr>
</tbody>
</table>

<sup>a</sup>Excludes milk as a beverage. <sup>b</sup>Dips, desserts, soup, oils, spreads, pasta toppings (e.g., pesto). <sup>c</sup>Milk, fruit juice, water, soft drink, sports drink. <sup>d</sup>Includes dry cereal, breads, and pastries. <sup>e</sup>Total number of menu items.
of a standard serve using Foodweb. Appropriateness and adequacy of each standard serve were also assessed by comparison with existing definitions in the AUSNUT database and also using the experience of the catering staff and first author. Standard serve sizes were adjusted as required to ensure that the portion size was reasonable, particularly for the predominantly athlete client base. Catering management communicated the need for standard serves to front-of-house staff during in-service training. Front-of-house compliance to serving size guidelines was also monitored during the games because errors would influence patron interpretation of nutrient intake reported on point-of-choice cards.

The Web Site

A Web site was developed to allow athletes and others (e.g., team dietitians, coaches, sports scientists) to view the menu in advance of the Olympic Games, providing a customized service without barriers of time and physical location. Athletes could view the foods offered and plan their intake from anywhere in the world before their arrival in the Olympic village. This was particularly important for athletes with special dietary needs or sports nutrition requirements (e.g., making weight before competition). To ensure the dynamic nature of the Web site and compatibility across all components of the project, Foodweb was used as the backend database.

In Service of Catering Staff

In-service training was conducted by sports dietitians experienced in food-service management. Senior catering staff \( (N = 60) \) attended one of three education sessions held before the games. These sessions provided an overview of current sports nutrition recommendations and addressed issues pertaining to compliance with standard recipes, risk management to reduce cross-contamination with food allergens, and maintenance of dish and serving size uniformity. Recipe compliance was considered a potential problem because chefs routinely exert their individual creative style (particularly with added fat). However, strict compliance from preparation through to service was critical to maintaining the accuracy and integrity of the point-of-choice labels.

Patron Satisfaction Evaluation

Patron satisfaction ratings on menu taste, temperature, freshness, and portion size were obtained using a 4-point Likert scale (from very good to poor). Food variety (e.g., meat/pasta/rice-based meals, vegetables/salad, fruit, treat, low-fat, and snack food) was assessed using a 5-point Likert scale (from strongly agree to strongly disagree). Satisfaction surveys were randomly distributed to athletes eating in the main dining hall over the course of the games by door security and nutrition kiosk staff.

Athletes’ \( (N = 414) \) evaluation of the menu was generally favorable. Most rated the taste (89%), temperature (89%), freshness (92%), and portion sizes (96%) as good or very good (Figure 5). There was no significant difference in
menu satisfaction between genders, sporting categories, or regions. Most respondents agreed or strongly agreed that there was sufficient variety (86%) and adequate meat (85%), pasta/rice (84%), vegetable/salad (85%), fruit (79%), and snack (76%) menu items. However, respondents from Africa and Asia indicated that too many meat dishes were offered on the menu (Table 2). This probably reflects the cultural importance of carbohydrate-based staples (e.g., rice, noodles) in these regions (Kittler & Sucher, 2008). Although 75% of all respondents indicated that there were too many treat foods offered, respondents from affluent

![Figure 5](image)

**Figure 5** — Athletes’ evaluation of the menu.

**Table 2** Median Response by Region to Specific Questions About the Menu

<table>
<thead>
<tr>
<th>Region</th>
<th>Too many meat dishes</th>
<th>Sufficient treat foods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia/Oceania</td>
<td>Disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td>Africa</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>Asia</td>
<td>Agree</td>
<td>Agree</td>
</tr>
<tr>
<td>Eastern Europe</td>
<td>Not sure</td>
<td>Not sure</td>
</tr>
<tr>
<td>West Europe</td>
<td>Not sure</td>
<td>Agree</td>
</tr>
<tr>
<td>North America</td>
<td>Disagree</td>
<td>Disagree</td>
</tr>
<tr>
<td>Central/South America</td>
<td>Not sure</td>
<td>Agree</td>
</tr>
</tbody>
</table>

*p* < .001

*Chi-squared test statistic was used to test difference in the median response between regions.*
Western countries (Australia, North America) reported that there were insufficient treat foods (Table 2).

**Conclusions and Applications**

This article describes various aspects of the development, analysis, and implementation of the menu available to athletes and patrons in the main dining hall of the Athletes Village at the Sydney 2000 Olympic Games. Sports dietitians played a valuable role in ensuring that the menu accommodated the general and therapeutic dietary needs of athletes from a range of cultural and sporting backgrounds. This might have contributed to the positive feedback about the menu from most athletes and the small number of minor anecdotal complaints. A more specific focus on African cuisine at future Games might help improve patron satisfaction.

The Foodweb database was integral to the success of the program and helped reduce the workload of the dietitian and catering team. A database of this nature has the potential for universal application at future competition events. The extensive capabilities and dynamic nature of a database can provide future organizing committees and caterers with tools that can boost efficiency and reduce labor costs. In addition, a database can provide the basis for interactive Web sites such as the one developed for this study and can be an educational tool for athletes.

As a result of the success of various components of the Sydney 2000 nutrition support program, sports dietitians have continued to have input into food provision and labeling at subsequent Olympic Games (Athens 2004 and Beijing 2008). Experiences and comments obtained from sports dietitians involved in the Sydney 2000 Games, particularly those who assisted during the menu-development phase, indicate that earlier involvement would have improved the efficiency of menu planning, analysis, and capacity for resource development for athletes and officials. The lack of a nutrition policy specifically designed for the Olympic Games appears to be a significant barrier to the successful provision of a suitable menu to meet the performance, cultural, and special dietary needs of athletes. A change in organizers, caterers, host nations, athletes, and officials every 4 years makes continuity in food provision extremely difficult. To ensure the longevity of a nutrition support program such as the one provided at the Sydney 2000 Games, it is essential that a nutrition policy be included as a mandatory component of the catering tender document for future Olympic Games.

The success of the nutrition program at the Sydney 2000 Olympic Games depended on building and sustaining a relationship between organizations with differing agendas and concerns. Although this requires a high level of commitment and time investment in developing partnerships, working with the organizers and caterers can bring about lasting and systemic change. Furthermore, development of an international nutrition policy specifically designed for the Olympic Games can potentially have a sustainable influence on the nutrition environment. This has the potential to have profound effects on food provision and athletes’ nutritional support at a critical time in their sporting career.
Acknowledgments

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