

STUDY OF SATISFACTION TOWARDS THE FOOD SERVICES IN THE PPLP AND SKO ATHLETE DORMITORIES IN INDONESIA

Mirza Hapsari Sakti Titis Penggali^{1*}, Zaenal Mutaqqien Sofro², Laksono Trisnantoro³, Edi Nurinda Susila⁴, Ernawaty⁴, Bayu Rahadian⁵, Margono⁵, Dadi Sujadi⁵, Raden Isnanta⁵, Marina Hardiyanti¹, Nia Bactiar⁶, Remydhina Mahsa Alvita Ghany⁷

¹ Departemen Gizi Kesehatan, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan Universitas Gadjah Mada, Indonesia

² Departemen Ilmu Fisiologi, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan Universitas Gadjah Mada, Indonesia

³ Departemen Manajemen Kebijakan Kesehatan, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan Universitas Gadjah Mada, Indonesia

⁴ Pusat Pengembangan Ilmu Pengetahuan dan Teknologi Kesehatan Olahraga, Kementerian Pemuda dan Olahraga Republik Indonesia

⁵ Deputi III Pembudayaan Olahraga, Kementerian Pemuda dan Olahraga Republik Indonesia

⁶ First Sport Nutrition Consulting, Yogyakarta, Indonesia

⁷ Mahasiswa Pendidikan Profesi Dietisien, Departemen Gizi Kesehatan, Fakultas Kedokteran, Kesehatan Masyarakat, dan Keperawatan Universitas Gadjah Mada, Indonesia

*E-mail: mirza.hapsari@ugm.ac.id

ABSTRACT

Providing food for athletes is a special institutional arrangement that caters to athletes' specific needs. Athletes have different nutritional requirements than the non-athlete population, as they need more nutrients to compensate for the energy expended during training, competitions, and recovery after matches. Additionally, athletes must focus on fluid intake and sufficient nutrients to support post-training recovery for optimal performance. Therefore, meeting the needs and satisfaction of athletes becomes a crucial goal for athlete food service. Satisfaction can be assessed based on various indicators such as variety of menu and ingredients, suitable portion size, taste, serving time, packaging, and food handler hygiene. This study aims to assess athletes' satisfaction with the food service in athlete dormitories. The research is an observational survey with a cross-sectional approach involving 159 athletes aged 13-19 years from PPLP West Java, PPLP DIY, PPLP NTB, and SKO Cibubur. Data collection took place in May and July 2022. The research instrument used was a customer satisfaction survey questionnaire with a Likert scale ranging from 1 to 4, where one indicates 'very poor' and four indicates 'excellent.' The analysis technique used Pearson correlation in SPSS 16.0 software. The research showed a relationship between menu variety, ingredient variety, suitable portion size, serving time accuracy, food packaging, serving area, food handler hygiene, food presentation, and food taste with athletes' satisfaction level. Serving time accuracy, food packaging, hygiene, cleanliness of the serving area, food handler hygiene, food appearance, and taste correlate strongly with satisfaction.

Keywords: food service, athlete, satisfactory study, athlete dormitory

INTRODUCTION

The provision of meals includes a series of activities ranging from menu planning to food presentation and distribution (Widyastuti et al., 2018; Penggali et al., 2021). Based on the type of institution, meal provision for athletes falls under the category of meal provision in specialized institutions because athletes have different needs compared to the general population and need to consider other aspects, such as training

periodization and caloric requirements based on the type of sport (Widyastuti et al., 2018; Penggali et al., 2021). Athlete meal provision is one of the supportive aspects aimed at providing high-quality food for athletes to support their optimal health, which is crucial for enhancing athletic performance (Penggali et al., 2021).

Customer satisfaction is an assessment that aligns with customer expectations regarding various aspects of food service, including taste, cleanliness, healthiness, and nutritional value

(Widyastuti et al., 2018). Various cooking methods can affect the content of active ingredients and nutritional value of the food, as well as the appearance of the food, which can ultimately affect the acceptance of the food (Gliszczynska-Swig et al., 2006; Miglio et al., 2008). The variety of food ingredients and menu preparations also affects athletes' acceptance and satisfaction with the food served. One study by Afriani (2017) on pencak silat athletes in PPLP Yogyakarta showed that athletes' acceptance and satisfaction with staple foods were lower than animal protein, plant-based protein, vegetables, and fruits (Afriani et al., 2017).

Poor assessment of food quality can affect consumers' food intake. If consumers are not satisfied with the food served, it can lead them not to finish their meals or not consume the food. It affects the quantity and quality of nutrients entering the consumers' bodies. Previous research conducted by Marlenywati (2017) at an integrated Islamic school found that 80% of students had nutrient intake below the Recommended Dietary Allowance for 2013, 70% of students were dissatisfied with the food served because it was not appealing, and 80% were dissatisfied because the food lacked variety (Marlenywati et al., 2017).

Nutrient intake is crucial to support athletes' performance, especially during adolescence when optimal physical growth occurs, requiring an adequate intake of nutrients (Penggalih et al., 2021; Marlenywati et al., 2017). Based on the Nutritional Adequacy Rate in 2019, adolescents aged 15-18 years have a carbohydrate requirement of 292 grams per day, and their calcium, iron, zinc, and magnesium needs are twice as high as other age groups (Permenkes, 2019; Almatsier, 2011). These requirements increase further with the additional physical activity burden of athletes. Given this background, a satisfaction study on meal provision at athlete training centres and schools is important.

METHODS

The research in this study is an observational survey with a cross-sectional design. The research was conducted on adolescent athletes aged 13-19 years who trained at the PPLP (Center for Education and Sports Training for Students) in

West Java, DIY, NTB, and SKO (Special School for Athletes) in Cibubur, with a total of 159 subjects. The sampling technique in this study used total sampling by involving all athletes who received food services at the targeted PPLP and SKO institutions and were willing to provide assessments of meal provision. The instrument used was a meal provision satisfaction survey questionnaire conducted in May 2022 at these institutions. The survey questionnaire contained questions related to various aspects of menu variety, types of food ingredients, portion suitability, timeliness, packaging cleanliness, personnel, facilities, and food taste, rated on a Likert scale with scores of 1-4. A score of 1 is considered poor, 2 is considered sufficient, 3 is considered good, and 4 is considered excellent.

After data collection, descriptive analysis tests were conducted to determine the characteristics of the subjects, and Pearson correlation tests were conducted to determine the relationship between each assessment aspect and athlete satisfaction levels. Statistical analysis was performed using SPSS software version 16.0. This research has obtained ethical approval from the Faculty of Public Health and Nursing Ethics Committee numbers KE/FK/0100/EC/2021 with amandemen number was KE/FK/0512/EC.

RESULTS

The age of the research subjects was predominantly in the 13-16 years range, with an average age of 16 years, corresponding to grades X and XI. Regarding gender, more male athletes were participating in the study (Table 1).

Based on testing the relationship between various aspects of satisfaction assessment and the level of athlete satisfaction, the results show that the level of athlete satisfaction is considered sufficient, with an average score of 2.91.

This level of satisfaction is influenced by menu variety, variety of food ingredients, portion suitability for athletes' needs, timeliness of service, presentation packaging, cleanliness and tidiness of the serving area, cleanliness and tidiness of personnel, food appearance, and food taste. The variable with the most robust relationship with the level of satisfaction, as assessed by

Table 1. Characteristic of the participants

Variable	N (%)
Age	
Early adolescent (13-16)	93 (58,4%)
Late adolescent (17-19)	66 (41,6%)
Gender	
Male	81 (50,9%)
Female	78 (49,1%)

Table 2. Relationship between various assessment aspects and satisfaction level

Variable	r	Satisfaction level
		p-value
Punctuality in serving	1**	0,000*
Neat and clean food packaging	1**	0,000*
Clean and orderly presentation area	1**	0,000*
The serving staff maintains cleanliness	1**	0,000*
The appearance of the served food	1**	0,000*
Taste of the food	1**	0,000*
Overall menu variation	0,832**	0,000*
Menu variation of carbohydrate	0,812**	0,000*
Menu variation of animal protein	0,782**	0,000*
Menu variation of plant protein	0,764**	0,000*
Menu variation of vegetable	0,781**	0,000*
Variation of carbohydrate	0,817**	0,000*
Variation of animal protein	0,819**	0,000*
Variation of plant protein	0,837**	0,000*
Variation of vegetable	0,816**	0,000*
Variation of fruit	0,694**	0,000*
The suitability of carbohydrate dish portions to meet the needs	0,851**	0,000*
The suitability of animal-based dish portions to meet the needs	0,825**	0,000*
The suitability of plant-based dish portions to meet the needs	0,877**	0,000*
The suitability of vegetable dish portions to meet the needs	0,781**	0,000*
The suitability of fruit portions to meet the needs	0,805**	0,000*

* significant if $p \leq 0.05$;** there is an association if $r > 0,159$ (r table)

the Pearson correlation test, is the timeliness of service, followed by food packaging, cleanliness and tidiness of the serving area, cleanliness of personnel, food appearance, and food taste (Table 2). The better the service aspects in terms of timeliness of service, neat and clean food packaging, cleanliness and tidiness of the serving area, cleanliness of personnel, and food taste, the higher the level of satisfaction will be.

The assessment of athletes on several aspects of satisfaction in the provision of meals at PPLP DIY, West Java, NTB, and SKO Cibubur is considered satisfactory, with an average score above 2.5 to 3.0 out of a total score of 4.0. This indicates that the majority of athletes have given a positive assessment of the meal provisions at these locations. Therefore, it can be assumed that the meal provisions at these places generally meet the expectations or satisfaction of the athletes in various measured aspects. However, it is still important to continuously monitor and improve the quality of food services to ensure the athletes' satisfaction is consistently maintained.

Regarding menu variety, the average score ranges from 2.7 to 3.0, which falls into the categories of fair to good (Table 3).

Regarding the variety of food ingredient groups processed, the average assessment score ranges from 2.69 to 2.94, which falls into the category of "satisfactory" (Table 4).

Regarding the appropriateness of portion sizes for each dish group, the assessments range from 2.79 to 2.97, which falls into the "satisfactory" category (Table 5).

A good rating with an average score of 3.1 is given to aspects related to timeliness, cleanliness, and the neatness of food packaging, the dining

Table 3. Assessment of menu variation aspect

Variable	N	Mean
		± Std. Deviation
Overall menu variation	159	2,89 ± 0,83
Menu variation of carbohydrate	159	3,03 ± 0,76
Menu variation of animal protein	159	2,94 ± 0,83
Menu variation of plant protein	159	2,79 ± 0,77
Menu variation of vegetable	159	2,7 ± 0,89

Table 4. Assessment of aspects of variations in types of food ingredients

Variable	N	Mean
		± Std. Deviation
Variety of carbohydrate	159	2,94 ± 0,75
Variety of animal protein	159	2,86 ± 0,81
Variety of plant protein	159	2,79 ± 0,76
Variety of vegetable	159	2,69 ± 0,87
Variety of fruit	159	2,86 ± 0,89

Table 5. Assessment of portion suitability aspect

Variable	N	Mean
		± Std. Deviation
The suitability of carbohydrate dish portions to meet the needs	159	2,97 ± 0,72
The suitability of animal-based dish portions to meet the needs	159	2,91 ± 0,72
The suitability of plant-based dish portions to meet the needs	159	2,79 ± 0,79
The suitability of vegetable dish portions to meet the needs	159	2,92 ± 0,81
The suitability of fruit portions to meet the needs	159	2,89 ± 0,89

Table 6. Assessment of aspects related to timeliness, packaging, premises, personnel, presentation, and taste of food

Variable	N	Mean
		± Std. Deviation
Punctuality in serving	159	3,18 ± 0,75
Neat and clean food packaging	159	3,11 ± 0,79
Clean and orderly presentation area	159	3,17 ± 0,73
The serving staff maintains cleanliness	159	3,16 ± 0,77
The appearance of the served food	159	2,83 ± 0,88
Taste of the food	159	2,82 ± 0,85

area, and the staff. Meanwhile, other aspects are considered satisfactory, ranging from 2.82 to 2.83.

DISCUSSION

a. Menu variation

Good food quality enhances athletes' perception of food satisfaction, increasing their attendance in the cafeteria and reducing the likelihood of athletes purchasing food outside the cafeteria (Jamaluddin et al., 2014).

Based on the assessment of 159 athletes, the evaluation of menu variety in the food provision at PPLP NTB, DIY, West Java, and SKO Cibubur tends to be good, with an average score of 2.89 out of a total score of 4 (Table 3). The menu variety that received the highest rating is the carbohydrate menu, with a score of 3.03, followed by the animal protein menu with 2.94, the vegetable menu with 2.79, and the variety of vegetables with 2.7 (Table 3). It can be seen from the reasonably diverse menu options. The carbohydrate menu has options such as white rice, wet rice, yellow rice, fried rice, ulam rice, *daun jeruk rice*, fried vermicelli, fried noodles, and spaghetti bolognese. In the animal protein menu, meat, chicken, eggs, and fish are prepared into various dishes, including hot and sour cook soy sauce, *opor*, *padang* spices, *curry*, *tongseng*, *bali* spices, *rawon*. The vegetable menu has various preparations of tempeh, tofu, and legumes, which are cooked as stir-fry, fritters, dreadlocks, steamed sugar, soup, and fried. The vegetable menu variety consists of stir fry, soup with condiment, soup with coconut milk, stew, sautee.

The data indicates that menu variety, both overall and specific to each menu category (carbohydrates, animal protein, plant-based protein, vegetables), is significantly related to athletes' satisfaction levels in food provision. Research conducted by Baiomy et al. (2017) states that factors influencing consumer satisfaction in food provision include menu descriptions, variety, and design (Jawabreh et al., 2018).

a. Type variation

The variety of food ingredients served (such as carbohydrates, animal protein, plant-based protein, vegetables, and fruits) has been shown to influence athletes' satisfaction levels with food provision significantly. This data aligns with research conducted by Ismail et al. (2019), which stated that with the increasing awareness of consumers in collage cafeteria that there is no single type of food could fulfil all nutritional needs. The availability of various types of

food ingredients (such as fruits, vegetables, carbohydrates, protein, and fats) can attract consumers to dine in the cafeteria (Ismail et al., 2019).

The athletes' assessments of the variety of food ingredients in the food provision show scores from highest to lowest: 2.94 for carbohydrates, 2.86 for animal protein, 2.86 for fruits, 2.79 for plant-based protein, and 2.69 for vegetables (Table 4). Overall, the assessment of the types of food ingredients processed is considered quite good due to the variety in the sources of carbohydrates, including rice, bread, noodles, pasta, potatoes, and flour-based products. The animal protein category combines various ingredients, including chicken, beef, lamb, chicken liver, chicken eggs, duck eggs, freshwater fish, sea fish, squid, shrimp, meat rolls, and fish meatballs. Various types of fruits, such as oranges, snakefruit, melons, watermelons, bananas, and papayas, show good variation. For plant-based protein, the food provision at PPLP and SKO processes various legumes, tempeh, and tofu. Likewise, with vegetables, there are various types, including cabbage, water spinach, spinach, carrots, cauliflower, green beans, long beans, broccoli, corn, green onions, mustard greens, white mustard greens, tomatoes, and bean sprouts.

In PPLP West Java, based on a 6-day cycle, the most frequently appearing type of carbohydrate is white rice with a frequency of 18 times, followed by potatoes 1 time, noodles 1 time, and vermicelli 2 times. The most frequently provided animal protein is chicken, with a frequency of 7 times, followed by fish and eggs 6 times, beef, tofu, and tempeh each 3 times, meat rolls 1 time, and chicken gizzards 1 time. Mixed carrots and cabbage appear most frequently among vegetables, with a frequency of 6 times, followed by green beans, long beans, green mustard, white mustard, red beans, chayote squash, jackfruit, and mushrooms, each appearing once. Fruits are served alternately daily, including melon, banana, orange, papaya, and watermelon.

RABU	RABU	RABU
NASI PUTIH	NASI PUTIH	NASI PUTIH
TONGKOL SARDEN	KAKAP SAOS PADANG	AYAM KECAP
TUMIS SAHUR UO	KIMLO KUAH	STUP SAYURAN
KERUPUK	PERKEDEL TEMPE	GIMBAL TAHU
BUAH-BUAHAN	KERUPUK	KERUPUK
AIR MINERAL	BUAH-BUAHAN	BUAH-BUAHAN
	AIR MINERAL	AIR MINERAL

Figure 1. Example of a one-day menu cycle at one of the PPLP facilities

\ The significant relationship between the variety of food ingredients and customer satisfaction is consistent with research conducted by Tanuwijaya et al. (2019), which showed that the greater the variety of food ingredients used, the higher the level of satisfaction. Furthermore, as the variety of food ingredients increases, the menu options also expand. Consequently, customer satisfaction can increase with a more diverse menu selection.

b. Portion Size

Portion adequacy is one of the crucial aspects of food provision that can influence consumer satisfaction (Agustina, 2016). Standardized portions can be used to predict nutrient adequacy and consumer intake. The amount of food portions athletes need can vary between different types of sports (sports disciplines). For example, endurance sports may require higher calorie intake due to the longer duration of exercise, ranging from 30 minutes to 4 hours, while strength sports generally have shorter exercise durations. Therefore, the quantity and type of carbohydrates needed may differ. In endurance sports, complex carbohydrates are needed in larger quantities than in strength sports, which require carbohydrates in simpler forms (Penggali, 2020). Portion sizes can also vary among individuals based on their preferences, affecting their satisfaction levels (Agustina, 2016). The size of food portions can also impact the visual presentation or appearance of the food, affecting their likability.

The food portions' suitability received a good rating with an average score of 2.79 to 2.97 out of a total score of 4. It indicates that athletes are satisfied with the standardized portions of food served for carbohydrate variants, animal protein, plant-based protein, vegetables, and fruits. This study suggests that portion suitability correlates with athletes' food provision satisfaction. Research on food provision for athletes at PPLP West Java conducted by Putra (2021) also shows a relationship between portion suitability and athlete satisfaction.

Taste, Food Appearance, Presentation Time, Cleanliness of Space, and Service

Providing food specifically for athletes should aim to meet their nutritional needs following the periodization of their training programs (Sedyanti,

2014). Among various assessment aspects, the appearance of food plays a crucial role in athlete satisfaction. Food appearance encompasses several components: presentation, portion size, texture, shape, and colour. The more diverse the food variations across these components, the more attractive it is to consumers (Putra et al., 2021). Additionally, good food appearance must be complemented by delicious taste. Unpleasant taste can diminish food quality and lead to food waste as consumer expectations are unmet (Heikkilä et al., 2016).

In the assessment of food taste, a score of 2.82 out of a total score of 4.0 was obtained (Table 6), indicating that athletes are reasonably satisfied with the taste of the food served. For the aspect of food appearance, the assessment score is 2.83 out of 4.0 (Table 6), indicating a “Satisfactory” level of satisfaction. Meanwhile, for the aspects of serving time, cleanliness of the dining area, and handling of food, scores above 3.0 were obtained, indicating a “Good” rating.

In this study, the accuracy of food serving time is closely related to consumer satisfaction both before and after the nutritionist intervention ($p=0.000$). According to research conducted (Sunarya & Puspita, 2018) on patients at the Sultan Syarif Mohamad Alqadri Hospital in Pontianak, timely meal service can enhance patient acceptability. Timeliness is also important to prevent food waste. Because the timing of meals matches meal times, consumers’ appetites remain intact. The food serving time accuracy also reflects the food service staff’s ability to adjust portion sizes and food composition to match consumers’ meal times (Dewi, 2019). The timing of meals for athletes needs to consider their training schedules. Based on research conducted by (Hasbullah et al., 2017), athletes are typically provided with 3 main meals and 3 snacks, with breakfast and dinner given after athletes finish their training to avoid digestive problems and optimize performance by providing a snack before training. Thus, training can be carried out optimally.

Applying hygiene and sanitation in food provision is essential to prevent food poisoning (Odeyemi et al., 2019). This study shows that consumer satisfaction is influenced by the cleanliness and tidiness of food handlers and

dining areas ($p=0.000$). This is in line with the research conducted by (2007), which found that the cleanliness of food service facilities and food handlers is a significant factor affecting consumers’ decisions to dine at a particular location. Most consumers rely on their judgment to assess hygiene risks, with the cleanliness of food handlers’ hands during food service being the primary assessment frequently conducted by consumers. Additionally, a study by Park et al. (2016) revealed that 5 sanitation dimensions affect consumers’ emotions or feelings towards consuming food at a food service facility: cleanliness of food handlers, dining area, food handling, dining room appearance, and the availability of bathrooms. Therefore, improving the knowledge and behaviour of hygiene in all aspects of food service is an important component, and regular programs should be implemented (Pepple, 2017).

Consumer satisfaction perceptions are also influenced by food packaging. In addition to food storage, packaging also serves as a product representation, maintains the safety and freshness of food, provides nutritional value information, and protects food products during distribution (Claudio, 2012). In the context of food provision at athlete training centres, self-service or buffet-style dining is commonly encountered. This type of service allows athletes to select various menu options provided in large serving containers (Penggalih et al., 2021). To enhance consumer satisfaction, the accuracy of food packaging should be considered, considering aspects such as the cleanliness of serving utensils, food temperature control, and alignment with athletes’ meal needs (Penggalih et al., 2021) (Rodgers, 2007).

CONCLUSION

The satisfaction rating of athletes at PPLP and SKO regarding the food provision in the athlete dormitories is considered good in several aspects, including the timely serving of meals and the cleanliness and neatness in food packaging, the dining area, and the food handlers. All assessed aspects related to menu variety in PPLP and SKO, both overall and for each type of dish, the variety of food ingredients, portion suitability for athlete needs, meal serving timeliness, packaging

presentation, dining area condition, food handler cleanliness, food appearance, and food taste, are associated with athlete satisfaction. The aspects that have the strongest correlation with satisfaction levels are the timeliness of meal service, food packaging, the cleanliness and tidiness of the dining area, the cleanliness of food handlers, food presentation, and food taste.

SUGGESTION

The correlation between food ingredient variety, menu variety, and athlete satisfaction in meal provision provides a basis for considering ongoing efforts to modify menus and arrange menu cycles to prevent athletes from becoming bored with the food provided. Menu cycles could be extended to longer, such as a 10-day cycle, to offer greater diversity in food options.

ACKNOWLEDGEMENT

We want to express our gratitude to the Education Fund Management Agency through the RISPRO LPDP 2020 – 2022 Competition Scheme (PRJ-106/LPDP/2019) for supporting the completion of this research project. Furthermore, we thank the institutions involved in this study, including PPLP West Java, PPLP NTB, PPLP DIY, and SKO Cibubur, as well as the Ministry of Youth and Sports of the Republic of Indonesia.

REFERENCES

- Afriani, Y., Sri, K., Umi, M. Daya Terima Atlet Pencak Silat Pada Pemberian Menu Siklus 3 Hari di PPLP Yogyakarta. *Medika Respati* 2017;Vol 12.
- Agustin, M. & Trigono, A., 2016. Determinan Kualitas Pelayanan Penyajian Makanan Pasien Rawat Inap Pada Unit Gizi RSUD Kabupaten Bekasi Tahu 2015. *Jurnal Bidang Ilmu Kesehatan*, 7(1), 382-386.
- Agustina, F., (2016). Hubungan Antara Daya Terima Makanan dengan Tingkat Kepuasan Pelayanan Gizi Pasien Hipertensi Rawat Inap di RSUP dr Soeradji Tirtonegoro Klaten. Universitas Muhammadiyah Surakarta
- Aksoydan, E., 2007. Hygiene Factors Influencing Customers' Choice of Dining-Out Units: Findings from A Study of University Academic Staff. *Journal of Food Safety*, 27(3), 300-316.
- Almatsier, Sunita. 2011. *Prinsip Dasar Ilmu Gizi*, Jakarta. PT. Gramedia Pustaka Utama.
- Baiomy *et al.* 2017. The influence of menu design, menu item descriptions and menu variety on customer satisfaction. A case study of Egypt. *Tourism and Hospitality Research*, Volume 19 (1).
- Claudio, L., 2012. Our Food: Packaging & Public Health. *Environmental Health Perspectives*, 120(6), A233-237.
- Dewi, P. E. A. K., 2019. Tingkat Kepuasan Klien Terhadap Makanan yang Dihidangkan di UPTD BAPELKESMAS Dinas Kesehatan Provinsi Bali. Diploma thesis, Poltekkes Denpasar.
- Gliszczynska-Swig A, Ciska E, Pawlak-Lemanska K, Chmielewski J, Borkowski T, Tyrakowska B. Changes in the content of health-promoting compounds and antioxidant activity of broccoli after domestic processing. *Food Addit Contam* 2006;23:1088–98.
- Hasbullah, U. H. A., Setiyowati, E., Widiatmi, N. & Dzulqarnaen, F. F., 2017. Sistem Penyelenggaraan dan Pengelolaan Makanan Bagi Atlet Sepak Bola. *Jendela Olahraga*, 2(1), 148-154.
- Ismail, S., Kadir, N., Pusiran, A.K., Zen, I.S., Khan, A. The Importance of Menu Variety Experience for Public Health Sustainability at Higher Education Institution. *Indian Journal of Public Health Research & Development*, Sept 2019, Vol.10, No.09
- Jamaluddin, R., Redzwan, S.M., Hong, C.C. Athlete's Nutrition Knowledge and Their Perception and Satisfaction in the Foodservice Quality of the Athlete's Cafeteria. *Journal of Foodservice Business Research*, 17:242-256, 2014.
- Marlenywati, Ismail, S., Popy L. Gambaran Asupan Zat Gizi Makro dan Mikro, Sisa Makanan, Status Gizi, dan Tingkat Kepuasan Mutu Hidangan Santri pada Sistem Penyelenggaraan Makanan (Studi di Sekolah Menengah Atas Islam Terpadu Al-Fityan Kabupaten Kuburaya). *Jurnal Mahasiswa dan Penelitian Kesehatan* 2017; Vol 4 No. 2
- Miglio C, Chiavaro E, Visconti A, Fogliano V, Pellegrini N. Effects of different cooking methods on nutritional and physicochemical characteristics of selected vegetables. *J Agric Food Chem* 2008;56:139–47.
- Odeyemi, O. A., Sani, N. A. & Obadina, A. O., 2019. Food Safety Knowledge, Attitudes and

- Practices Among Consumers in Developing Countries: An International Survey. *Food Research International*, Volume 116, 1386-1390.
- Penggalih, Mirza H.S.T., Solichah, K.M., dan Nadia, A. dkk. 2021. *Pedoman Penatalaksanaan Gizi Atlet*. Yogyakarta. UGM Press.
- Penggalih, Mirza H.S.T.P dkk. 2020. *Gizi Olahraga I, Sistem Energi, Antropometri, dan Asupan Makan Atlet*. Yogyakarta : UGM Press.
- Penggalih, Mirza H.S.T.P dkk. 2021. *Pedoman Penatalaksanaan Gizi Atlet*. Yogyakarta : UGM Press.
- Pepple, N., 2017. Environment and Food Poisoning: Food Safety Knowledge and Practice among Food Vendors in Garki, Abuja – Nigeria. *Journal of Health Education Research and Development*, 5(2), 1-4.
- Peraturan Menteri Kesehatan Republik Indonesia Nomor 28 Tahun 2019 Tentang Angka Kecukupan Gizi yang Dianjurkan Untuk Masyarakat Indonesia. Menteri Kesehatan Republik Indonesia.
- Putra, A., Ronitawati, P., Sitoayu, L., Nuzrina, R., & Melani, V. (2021). Sistem Penyelenggaraan Makanan, Preferensi Menu dan Tingkat Kepuasan di PPLP Jawa Barat. *Ghidza: Jurnal Gizi Dan Kesehatan*, 5(1), 54 - 62. <https://doi.org/10.22487/ghidza.v5i1.152>
- Rodgers, S., 2007. Innovation in Food Service Technology and its Strategic Role. *International Journal of Hospitality Management*, 26(4), 899-912.
- Sedyanti, T., 2014. Pengalaman Penyelenggaraan Makanan untuk Atlet. Presented in PERSAGI Congress Yogyakarta, 25-30 November.
- Sunarya, I. & Puspita, W. L., 2018. Perbandingan Daya Terima Makanan Serta Faktor-faktor yang Mempengaruhi Pada Sistem Penyelenggaraan Makanan Swakelola dan Outsourcing. *PNJ*, 1(2), 74-77.
- Tanuwijaya, Laksmi Kurnia *et al.* Kepuasan Pasien Terhadap Variasi Bahan Makanan di Rumah Sakit. *Jurnal Gizi* Volume 8 No 1 Tahun 2019.
- Widyastuti, N., Nissa, C., dan Panunggal, B. 2018. *Manajemen Pelayanan Makanan*. Yogyakarta. Penerbit K-Media.