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Master of Science in Engineering

Analyzing the Functional Spaces of
Military Dining Facilities Using
Analytic Hierarchy Process

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**Analyzing the Functional Spaces
of Military Dining Facilities Using
Analytic Hierarchy Process**

by
Seunghoo Lee

**A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Engineering**

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Abstract

Analyzing the Functional Spaces of Military Dining Facilities Using Analytic Hierarchy Process

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This research used Analytic Hierarchy Process(AHP) to analyze the importance and priority of functional space and evaluation factors of each functional space of the military dining facility.

Dining in the military is an important factor in restoring combat power and promoting morale. The military dining facility serves as a not only for meals, but also for watching TV, education and club activities. Workers working in dining facility spend most of their work hours in dining facility, perform tasks such as cooking, dishwashing, and leftover disposal, and take breaks. As such, the military dining facility is a space where various functions are performed, and space planning should take into account these various functions when planning the building of the dining facility.

However, the criteria for defense and military facilities, which are the basis for planning the space of military dining facility, are calculated

only by simply analyzing the standard floor plan to match the size of the person-to. Therefore, when there is space to be reduced in the total area, there are side effects such as leaving visible table space without consideration for priority or functional space, unseen office space, and adjusting the entire area through reduction of the lounge.

Accordingly, based on the priority of the space that the staff of the military dining facility considers important, this research aims to analyze the characteristics of each functional space through classification according to its unique function. This can be an indicator that can be used as a basis for future revision of the building floor area standards of the defense and military facilities standards, and it can improve usability with an efficient space plan that takes into account the characteristics of the Korean military and the satisfaction of its workers.

In addition, the results of this research can be applied not only to military dining facilities but also to school cafeterias where group meals are served.

Keyword : Military Dining Facility, Analytical Hierarchy Process(AHP), Functional Spaces, Evaluation Factor, Defense and Military Facilities Standards

Student Number : 2018-27048

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Chapter 1. Introduction

1.1. Research Background

Dining in the military facilities is an important factor in combat recovery and morale. In addition to meals, the military dining facility serves as a small-scale function of watching TV, education, and club activities. Workers working at dining facilities (cooking petty-officer / soldiers / military workers) spend most of their time in the dining room, performing tasks such as cooking, dishwashing, and processing the remaining dishes. Thus, the military dining facility is a space that performs several complex functions. When planning the dining facility construction, the space plan considering these various functions should be made.

In addition, due to the nature of military units, there is a high risk of transmission of diseases such as food poisoning, which leads to a decrease in combat power. The importance of hygiene management in a dining facility cannot be overemphasized, and the Hazard Analysis and Criteria Control Point System (HACCP), a hygiene management system, emphasizes that space improvement must be preceded for effective hygiene management with respect to the food-handling environment.

Inadequate space construction leads to movement that contradict hygiene principles, making hygiene management difficult, and when hygiene concepts are considered in the dining space, it becomes easier

to comply with hygiene principles and facilitates hygiene management (Lee, 2011). The plan should also take this into account.

However, the defense military facility standard, which is the standard in planning the space of the military dining facility, is a calculation formula that fits the size of the per capita by simply analyzing the standard floor plan. Accordingly, when there is space to be reduced in the total area, side effects such as adjusting the total area by deleting the invisible office and reducing the lounge without leaving the table space without consideration of priority criteria or functional space exist.

The construction plan of the military dining facility in the public facilities in Domestic shows only the total area corresponding to the ratio of the total number of civil servants, without considering the characteristics of the detailed space functions inside the dining facility. In the case of the US military, the floor space for each functional space is suggested in detail through the classification of functional spaces such as public area, serving area, preparation area, and support area. but there are limitations to apply due to differences in principal food and cooking methods.

1.2. Problem Statement

As mentioned earlier, the facilities standards for military dining facility should be dealt with importance, but they are not, and there are two significant problems.

First, military dining facility is very important place for the health of soldiers and provide combat power, but because they are not directly related to combat, they are less concerned than operation/combat facilities or other administrative/welfare facilities, and the defense military standards are less frequently revised.

Second, In the existing facility standards for military dining facility, only the table spaces, kitchen, storage, service area, and dishwashing room consisted of space, so that the actual dining facility space plan considering the user preference and usability has not been achieved. There are many cases where people are urged to meet the determined total area and omit essential elements such as staff offices.

1.3. Research Objective and Scope

This research aims to analyze the characteristics of each functional space through classification according to unique tasks based on user preference for military dining facilities. In addition, this analysis process and results are reflected in the building floor area standards of defense military facilities to improve the user's satisfaction in military dining facilities.

Through this, we will contribute to efficient space composition of current building standards and efficient use of defense budget.

The purpose of this research is to analyze functional spaces considering user preference for military dining facilities, to derive priorities by space, and to improve current standards. The subjects of the research were the spaces of military dining facilities, public areas (access, staff toilet, payment, table spaces), serving areas (tray preparation, distribution, return, drinking fountain), cooking areas (kitchen, dishwashing, leftover disposal), support areas (staff toilet, office, storage, loading dock)

1.4. Research Procedure

This research analyzes the functional space of each facility through interview investigation and then applies Analytic Hierarchy Process(AHP) to derive the importance and priority of each functional space. The detailed procedure for this is as follows.

(1) Investigate domestic and foreign precedent research and related criteria to draw implications.

(2) Analyze current military dining facility standards to identify functional spaces and evaluation factors and identify institutional status.

(3) Designing experiments such as developing questionnaires for AHP analysis by selecting functional spaces and evaluation elements classified by expert interview.

(4) Through the analysis of experimental results, the importance and priority of each functional space is derived.

(5) It suggests an improvement plan for rational and efficient military dining facility planning considering user preference.

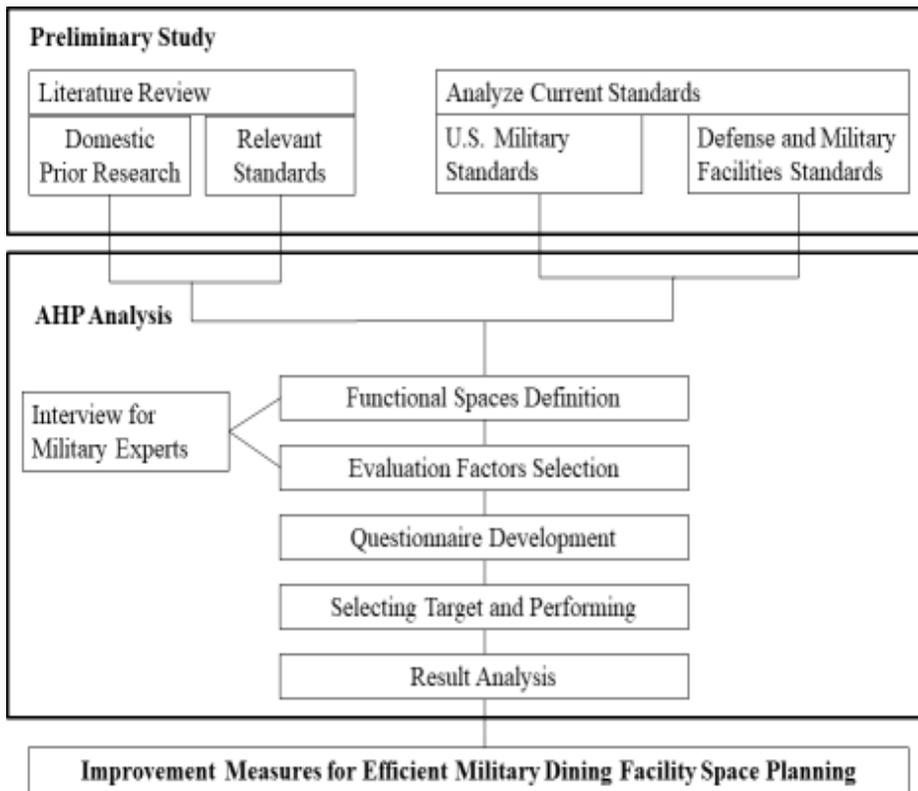


Figure 1-1. Research Process

Chapter 2. Preliminary Study

This chapter describes the previous researches related to dining facilities and the methods used by AHP in the field of architectural planning. Next, this chapter introduces the public domestic facilities standards and U.S. military cases.

2.1 Literature Review

Research into the space composition of dining facilities has been conducted continuously. Lee (2004) deduced the improvement plan of school meal facility dining facility plan through drawing analysis, field survey, questionnaire and interview. Chang (2009) conducted surveys and group discussions with experts on school meal facilities by function space (office, storage, inspection, pretreatment, cooking, serving, dishwashing, convenience) Facilities, etc. And area per person. Lee (2011) proposed the sanitary space composition of the entire self-service dining facility including kitchen space and customer space by applying the HACCP hygiene principle, and presented a schematic space structure diagram. In addition, Kim (2013) suggested improvement methods based on spatial and institutional analysis through surveys of students using student dining facilities and interview with dining facility operators.

Table 2-1. Researches on dining facility

Author	Contents
Lee (2004)	Improvement of school dining facility planning through drawing analysis, field survey and interview
Chang (2009)	A survey method and a group of experts on school feeding facilities presented areas by functional space and areas per person
Lee (2011)	Applying the HACCP, the proposal of hygienic space composition across self-service dining facilities, including kitchen and customer space, and the schematic spatial organization chart is proposed
Kim (2013)	A survey of students using student cafeterias and a meeting with dining facility operators suggested improvement measures based on spatial and facility analysis

Analytical Hierarchy Process (AHP), the methodology of this research, is one of decision support method that support systematic evaluation of decision-making objectives or alternatives with multiple evaluation criteria. (Saaty, 1980). The main feature of this method is to classify the complex problem into major and sub-factors, and to derive the importance through the pair contrast. As the approach most similar to the human thinking system, its usefulness is recognized in that it can analyze and structure problems and quantify relative importance to obtain quantitative results.

Table 2-2. Researches on the Application of AHP in Architecture

Author	Contents
Kil et all (2015)	Analysis of the importance of the location factor of nursing hospital using fuzzy function
Kang (2016)	Valuation of the dwelling selection criteria and identification of the preferred dwelling selection criteria
Lee & Choi (2017)	Evaluation of the relative importance of the golf course location
Joo (2019)	A survey experts and implications on the utilization of the characteristics of empty houses by region, and the effective utilization of rural blackings for welfare
Park et all (2019)	Presentation of functional space of military administrative facilities and priority of each evaluation element

In the field of architecture, AHP was used to analyze the importance of residential care centers using fuzzy function and AHP (Kil et al., 2015), and to evaluate the valuation of housing selection criteria and preferred housing selection criteria. (Kang, 2016). In addition, research on the use of AHP (Lee & Choi, 2017) and regional vacant house characteristics to evaluate the relative importance of golfer's location targets and expert surveys suggest that urban vacant houses are profitable and rural vacant houses are efficient alternatives for welfare. In addition, the AHP was applied to derive implications (Joo, 2019),

and AHP was used to prioritize the functional spaces of military administrative facilities and each evaluation factor (Park et al., 2019).

Based on the preceding studies, we confirmed that the classification of functional spaces and the procedures for improving user demands and satisfaction during building space planning are the key factors for efficient building planning. Since the usefulness of the analytical method has been demonstrated, AHP was also used in this research.

2.2 Standards of Domestic Public

National public-sector construction plans, public property and goods Decree Law standard design areas such as building standards, comply with the standards that are tailored to each area of intended use by officials in the number of regulations. By local ordinance, each local government regulates the area standard per person related to the job and the area of subsidiary space.

Table 2-3. Standards for public buildings

Categories	Contents
dining facility	$1.63\text{m}^2 \times N \times 0.3$
Staff lounge	$2.0\text{m}^2 \times N \times 0.15$
Civil service office	$(6.55\text{m}^2 \times N \times 1.1) +$ $(0.13\text{m}^2 \sim 0.2\text{m}^2 \times \text{number of civil compliant} \times 0.5)$
Data room	$(0.3\text{m}^2 \sim 0.4\text{m}^2) \times N$
Warehouse	$0.72\text{m}^2/N \sim 0.85\text{m}^2/N$
Computer room	$9.79\text{m}^2 \times N \times 1.2$

* N : Number of civil servants or staff in charge

In the case of administrative facilities such as offices, the area standard is specifically provided, but in the case of dining facility, the number is only multiplied by a certain ratio. The dining facility only regulates the total area, such as $1.63\text{m}^2 \times \text{number of civil servants} \times 0.3$,

and there are no detailed regulations on the detailed spaces (table space, cooking space, loading and unloading space, etc.) inside the dining facility.

A dining facility is a complex space that performs various functions such as preparation, cooking, waiting, washing, and storage as well as a dining room (table) space where meals are simply eaten.

2.3 Standards of US Military

Area standards for the planning, evaluation, and design of the US military's facilities standards are required to comply with the UFC (United Facilities Criteria). It provides the standards for dining facilities under the military Regulation, the Navy / Marine Corps under FC 4-722-01N, and the Air Force under FC 4-722-01F, which are slightly different depending on the characteristics of each military. The floor area standard by space is prescribed.

Table 2-4. USA Navy Dining Facility Space Program

Functional Components		Facility Size Classifications		
		1~80		1501~2200
Public	Dining Area and Circulation	86.9m ²	~	1021.9m ²
	Public Toilets	16.7m ²		34.4m ²
	Queue	12.1m ²		153.3m ²
	Sign-in Station	3.7m ²		11.1m ²
	Subtotal	119.4m ²		1220.7m ²
Serving	Regular Food Line	23.2m ²		120.8m ²
	Fast Food Line	0		60.4m ²
	Combination Food Line	0		0
	Beverage Line/Salad Bar	18.6m ²		98.1m ²
	Cashier Station	2.8m ²		23.2m ²
	Dish Washing	16.7m ²		95.9m ²
	Subtotal	61.3m ²		398.4m ²
Preparation	Kitchen	60.4m ²		148.6m ²
	Vegetable Preparation	0		55.7m ²
	Meat Preparation	0		46.5m ²
	Bakery	0		96.2m ²
	Utensil Wash	0		55.7m ²
	Subtotal	60.4m ²		402.7m ²
Support	Offices	21.4m ²		83.6m ²
	Staff Toilets	24.2m ²		46.5m ²
	Staff Lockers	0	44.6m ²	
	Janitor's Closet	2.3m ²	9.3m ²	
	Can Wash	3.7m ²	5.6m ²	
	Loading Dock	18.6m ²	37.2m ²	
	Subtotal	70.1m ²	226.7m ²	
Facility Subtotal		311.2m ²		2,248.5m ²
Storage ranges from 10 to 25% of Facility Subtotal				
Net-to-Gross ranges				

In addition, by carefully studying the relationship between storage, preparation, serving, and cleaning for each functional space of the military dining facility, a plan that provides the maximum flow and efficiency can be provided to keep the travel distance short and minimize the intersection of the circulation path.

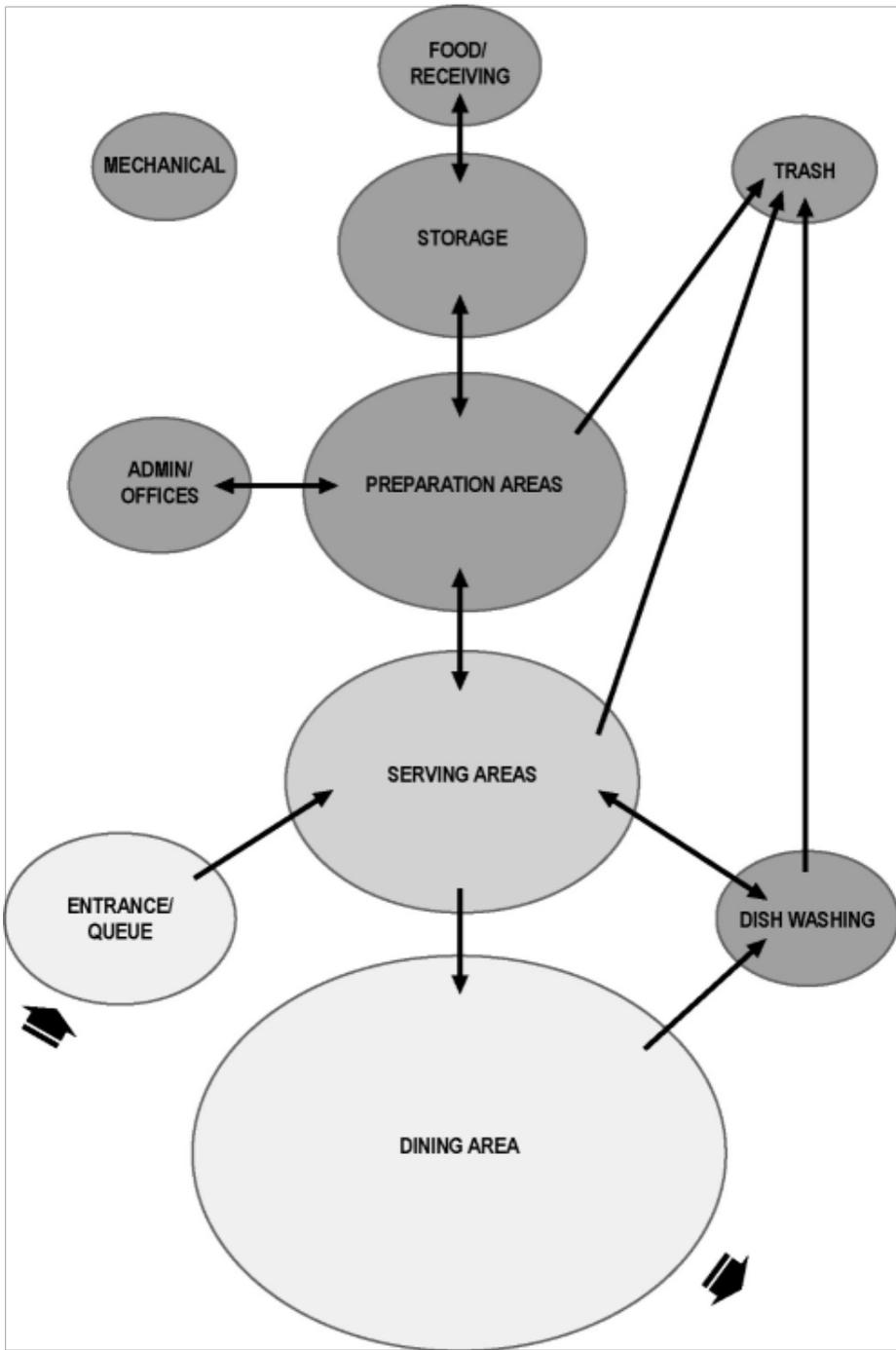


Figure 2-1. US Navy Dining Facility Flow Schematic

2.4 Summary

In this chapter, analyzed the previous researches on the space composition of the dining facility, and introduced the AHP, the methodology of this research, and the reasons for using AHP in this research. Also analyzed the research using AHP in architectural planning. And implications were drawn from the analysis of the architectural planning standards of the Domestic public sector and the architectural planning standards of the US military.

Chapter 3. Analysis of Military Facility Standard

This chapter deals with the architectural planning methods of the military facilities standard currently used by the military and the area-based analysis of the standards of military dining facility. In addition, the area standard of Korean and U.S. dining facility is compared and analyzed.

3.1 Architectural Planning Method

The architectural plan of military facilities follows the regulations published by the Ministry of National Defense Military Standards, among which the floor plan is based on the plan by calculating the area of facilities in the planning stage of the military facility project and the area of detailed rooms in the design stage. It is used to calculate site area at the project planning or basic planning stage (Defense of Military Installations, 2019).

The area specified in each standard is calculated by adding 25% of the net area for single floors and 30% of net area for two or more floors to obtain gross floor area.

Military dining facility ‘defense military standards of construction floor area standards’ of ‘04. sanitary and dining facilities’ becomes classified divided into soldiers, dining facilities and executive dining room has been applied to the criteria.

3.2 Area Standard Analysis

The standard of the catering cafeteria was selected by analyzing the existing standard. The standard diagram is literally just a standard example, and there is a limitation that the floor area standard itself is too simplified and the characteristics of the functional space and the user's preference are not considered.

Table 3-1. Military dining facility standard

Categories		Number of users	Criteria
HACCP Type		100	371m ²
		150	446m ²
		250	577m ²
		400	755m ²
		600	962m ²
Normal Type	Table	100~600	1.356~0.48N/500
	Kitchen	100~600	0.514-0.27N/500
	Warehouse	100~299	0.09m ² /N
		300~600	0.07m ² /N
	Service area	100	0.2m ² /N
		101~199	0.15m ² /N
200~399		0.1m ² /N	
400~600		0.08m ² /N	
Washing room	-	Automatic washing machine area	

In the case of the executive dining facility area standard, the dining facility area applies only the area standard calculated by the design, and there is no specific standard, so it is necessary to present a reference area for each function space.

Table 3-2. Executive dining facility standard

Categories		Criteria(m ² /N)
Table	Square(For 6)	1.48
	Sqaure(For 4)	1.72
	Circular(For 8)	2.46
	Circular(For 4)	2.49
Kitchen		0.36
Warehouse		0.09
Service area		0.16

3.3 Korea-US Military Standards Comparison

While the ROK military standards (defense military facility standard) do not differ from military to military, the US, military, marine, air, and marine units have separate standards. Although the floor area is divided by the number of people used, the US military provides more detailed area standards for each functional space. The ROK military uses the per capita area criteria for N, but the US military establishes a minimum area criterion based on the scale. Table 6 shows the Korea-US area comparison tables for the same size of per capita area.

Although it varies depending on the size of the personnel, the area standards for catering canteens based on military facilities are as small as 67% to 81% of those of the US military. The smallest difference between the defense standards and the US military area is cooking (87% to 102%), while the largest difference is the service area (26% to 29%). The service area and functional space are divided into offices, staff toilets, staff lockers, storage and loading dock.

Table 3-3. Korea-US Area Standards Comparison

Defense Military Facility Standard(Korea)				United Facilities Criteria(US Navy)						
Categories	150N	250N	400N	Categories	150N		250N		400N	
					Each	Sum	Each	Sum	Each	Sum
dining facility	181.8m ²	279.0m ²	388.8m ²	Dining Area and Circulation	151.4m ²	234.0m ²	174.2m ²	284.2m ²	278.7m ²	439.5m ²
				Queue	23.2m ²		30.2m ²		46.5m ²	
				Sign-in Station	3.7m ²		3.7m ²		5.6m ²	
				Food Line	29.7m ²		39.0m ²		57.6m ²	
				Beverage Line/Salad Bar	23.2m ²		32.5m ²		46.5m ²	
				Cashier Station	2.8m ²		4.6m ²		4.6m ²	
Cooking	64.9m ²	94.7m ²	119.2m ²	Kitchen	74.3m ²	74.3m ²	55.7m ²	92.4m ²	78.5m ²	122.6m ²
				Vegetable Preparation	0		20.4m ²		23.7m ²	
				Utensil Wash	0		16.3m ²		20.4m ²	
Storage	13.5m ²	22.5m ²	28.0m ²	Storage	38.6m ²	38.6m ²	47.4m ²	47.4m ²	68.5m ²	68.5m ²
Service	22.5m ²	25.0m ²	32.0m ²	Offices	28.8m ²	77.6m ²	37.2m ²	97.1m ²	53.9m ²	122.7m ²
				Staff Toilets	24.2m ²		24.2m ²		24.2m ²	
				Staff Lockers	0		11.1m ²		14.9m ²	
				Janitor's Closets	2.3m ²		2.3m ²		4.6m ²	
				Can Wash	3.7m ²		3.7m ²		3.7m ²	
				Loading Dock	18.6m ²		18.6m ²		21.4m ²	
Total	282.7m ²	421.2m ²	568.0m ²	Total	424.5m ²		521.1m ²		753.3m ²	

3.4 Summary

This chapter describes the current planning method and analysis of area standards for military dining facility. Through this, the limitations and directions for improvement of the defense military facilities standards, which are currently the planning method for the military dining facility.

Chapter 4. AHP Experiment Design for Analysis of Military Dining Facility Functional Spaces

This chapter covers the development of the AHP model. For layering, functional space and evaluation factors were selected for interview survey and analysis of literature review, and the AHP questionnaire was developed and survey was conducted.

4.1 Functional Space Definition of Military Dining Facility

The AHP analysis determines the endpoint by looking at all relevant factors for decision making. Since the empirical knowledge of the field is needed to stratify the AHP problem, the military conducted an interview with a group of experts who have worked in the cooking / cooking field for more than 20 years. These persons will be excluded from the AHP survey to be conducted in the next phase. After analyzing the interview results and document data, the functional spaces of military catering dining facilities were classified into public zones, serving zones, catering zones, and support zones through brainstorming, and the components were subdivided as follows.

Public areas generally occupy the largest area in a dining facility and consist of access functions (spaces) including doors, public toilets, payment functions (spaces), and table spaces for dining.

The serving area is adjacent to the public area, and the food standard fee (space) considering the moving route from the dish storage box, the waiting line at the serving table and the serving (space) to serving, the exit (space) until the meal is finished and the dishwashing room, It consists of drinking water (space), drinking water before leaving and using napkins.

The cooking area occupies the largest area except the public area, and cooks and cooks directly (space), washes the dishes by the users who finished the meal (space), and leaves (space) to process the remaining food.

The support area includes a space for material storage and inspection of food materials and a place for the convenience of the staff, and consists of a staff toilet, staff office, storage and loading dock.

Table 4-1. Components of Functional Spaces in Military dining facility

Categories	Component
Public Area	Access, Public toilet, Payment, Table spaces
Serving Area	Tray preparation, Distribution, Return, Drinking fountain
Cooking Area	Kitchen, Dishwashing room, Leftover disposal
Support Area	Staff toilet, Office, Storage, Loading dock

4.2 Evaluation Elements Selection of Military Dining Facility

In order to classify the problem, the evaluation factors for each functional space were selected as multipurpose, independence (space), convenience, sanitary, and integration. Multipurpose is the ability to handle various functions in one place. Independence is the need to secure independent space. Contrast this concept with convenience.

It is a characteristic that makes it easy and easy to move in the moving section and waiting section. As the corridor width between tables increases, the convenience decreases, but the independence (space) increases because the table space per person increases relatively.

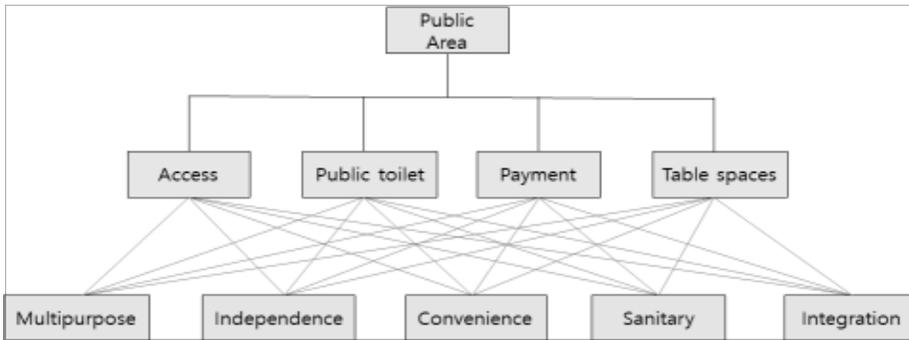
Sanitary is an important factor in the establishment of a dining facility and is a measure of health of soldiers. Integration is a function that processes in one space without separating the same functions of multiple spaces. In the military dining facility, when the public toilet and the staff toilet are used together, the integration is increased, but the sanitary is reduced because movement is not separated.

Table 4-2. Evolution Factors in Military dining facility

Categories	Contents
Multipurpose	Ability to handle a wide range of functions in one place
Independence	The need to free up space
Convenience	Characteristics that make a dining facility feel easy, such as moving section of a dining facility
Sanitary	A measure to determine the health of a soldier as an important factor in the composition of a dining facility.
Integration	Ability to handle the same functions of multiple spaces in one space without separating them

4.3 AHP Questionnaire Development

After the stratification process of functional spaces and evaluation factors for each space, the AHP questionnaire was developed as shown in the figure below so that the relative preferences could be investigated using the 9-point scale.



a. AHP Layering Schematic

Categories	Important		←		Equal		→		Important		Categories
	5	4	3	2	1	2	3	4	5		
Access											Public toilet
Access											Payment
Access											Table spaces
Public toilet											Payment
Public toilet											Table spaces
Payment											Table spaces

b. Relative importance of functional space

Categories	Important		←		Equal		→		Important		Categories
	5	4	3	2	1	2	3	4	5		
Multipurpose											Independence
Multipurpose											Convenience
Multipurpose											Sanitary
Multipurpose											Integration
Independence											Convenience
Independence											Sanitary
Independence											Integration
Convenience											Sanitary
Convenience											Integration
Sanitary											Integration

c. The Relative Importance of Evaluation Factors by Functional Space

Figure 4-1. questionnaire form

4.4 Questionnaire Selecting Targets and Performing

Eight military dining facilities were selected from the state-of-the-art BTL dining facility, which was recently completed with the cooperation of the Army Headquarters, to the place where the demolition is very few due to the new construction plan. The survey was conducted for 11 dining facility workers.

Table 4-3. Status of survey targets

Categories	Unit	Response count (NCO/Soldier/Military Civilian worker/Civilian worker)
Army	000 Infor- mation&Communic ation Battalion	3(1/1/0/1)
	000 Mechan- ized infantry Battalion	7(1/5/0/1)
	000 Artillery Battalion	9(1/7/0/1)
	00 Battalion	8(1/6/0/1)
	00 Tank Battalion	6(1/4/0/1)
	00 Artillery Battalion	7(1/5/0/1)
	00 Supply Battalion	7(1/5/0/1)
	00 Assault Air defense Battalion	8(1/6/0/1)
	Subtotal	55(8/39/0/8)
Navy	0 Fleet Command	4(0/3/0/1)
Air-force	00 Combat Squadron	10(2/8/0/0)
National troops	00 Academy	13(1/9/1/2)
Total		82(11/59/1/11)

Since the survey was conducted after interviews and explanations of dining facility workers during the on-site survey to determine the status of the catering dining facility, the collection rate was 100%, and a total of 82 questionnaires were collected.

Of the 82 questionnaires collected, 27 parts (about 33%) with inconsistency ratio (CR) within 0.2 were analyzed. In the AHP analysis, consistency is considered to be consistent when the inconsistency ratio is less than 0.1 and tolerable level of consistency when within 0.2. In this research, the subjects of the survey were dining facility workers, not experts in the field of architecture, and they were acceptable to the extent of inconsistency within 0.2.

4.5 Summary

This chapter describes the AHP experimental design process for functional space characterization. Functional spaces and evaluation elements were defined through expert interviews, and the survey was conducted through the selection of survey targets and field surveys in cooperation with the Army Headquarters.

Chapter 5. AHP Experiment Result Analysis

In this chapter, AHP analysis is performed based on the survey results carried out in Chapter 4. First, to derive priorities by function space and by evaluation factors of function space and comprehensive analyze the results.

5.1 Relative Importance Analysis by Functional Space

As a result of analyzing the priority of each functional space, it is shown in Table 5-1 for public area and serving area, and the priority of public area is in order of table spaces, access, payment, and public toilet. The reason why the public toilet was the least important was that the US military facility standard separated the public dining facility and the staff dining facility, but Korean military facility standard did not separate it. Without public toilets, dining facility users can be interpreted as reflecting the reality of using the toilet in the neighborhood dormitory for soldiers and the administrative facilities for executives. The reason for the low importance of the payment is that the soldier dining facility among the surveyed facilities does not have a payment function at all, and when the executives such as watchers eat, they do not count at the dining facility, but record it in the journal. It is interpreted as a method of subtracting from the corrosion cost to be paid later.

In the case of serving area, it was analyzed to be important in order of distribution, return, drinking fountain, and tray preparation. It can be seen that the importance of the distribution and return function directly related to the meal is considered to be more important than the standard cost of preparation and drinking fountain function after the meal.

Table 5-1. Relative importance of functional space(Public Area & Serving Area)

Functional space	Public Area	Functional space	Serving Area
Access	0.2931	Tray preparation	0.1485
Public toilet	0.1637	Distribution	0.4008
Payment	0.1791	Return	0.2596
Table spaces	0.3640	Drinking fountain	0.1908

Cooking and supporting areas are summarized in Table 5-2. In the case of cooking area, kitchen, dishwashing room, and leftover disposal were the most important, and the importance was distributed evenly without any significant difference. According to individual interview surveys, there were many opinions that the area of dishwashing and leftover disposal was needed and there was no significant difference, while the kitchen occupied in the cooking area was much larger than dishwashing and leftover disposal. It was interpreted that the area of the processing chamber needs to be enlarged.

Support areas were analyzed to be the most important in the order of office, staff toilet, loading dock, and storage. As a result of the BTL dining facility survey conducted in 2018 ~ 2019, there was a case where the office was completely omitted to meet the requirements of other spaces while the area of the entire dining facility was determined by the standard diagram. In some cases, offices are located in administrative facilities away from the offices, or simple offices are used in table spaces in public areas.

Table 5-2. Relative importance of functional space(Cooking Area & Support Area)

Functional space	Cooking Area	Functional space	Support Area
Kitchen	0.3973	Staff toilet	0.2288
Dishwashing room	0.3168	Office	0.3939
Leftover disposal	0.2859	Storage	0.1638
-		Loading dock	0.2135

5.2 Priority Analysis by Evaluation Factor

Next, we analyzed the priorities according to the evaluation factors by the functional space of the group military dining facility. In public areas, sanitary was found to be the most important except for the calculation function (space). In the next order, priority was the same in convenience, integration, independence, and multipurpose in access / public toilet / table space. In the case of payment, priority was shown in order of convenience, sanitary, integration, multipurpose, and independence. Through this, it was confirmed that sanitary is the most important evaluation factor not only in cooking areas but also in public areas, and the free space (convenience) in the width between queues and tables is more important than the free space (independence) of individual dining space.

Table 5-3. Relative Importance of Evaluation Factors(Public Area)

Public Area	Access	Public toilet	Payment	Table spaces
Multipurpose	0.1293	0.1111	0.1692	0.0637
Independence	0.1597	0.1749	0.1615	0.1229
Convenience	0.2288	0.2308	0.2734	0.2580
Sanitary	0.3225	0.3652	0.2006	0.4139
Integration	0.1597	0.1179	0.1953	0.1416

In the case of serving areas, priority was given in the order of sanitary, convenience, independence, integration, and multipurpose in all functional spaces, and as in public areas, overall sanitary is the most important and convenience rather than the size of individual space.

Table 5-4. Relative Importance of Evaluation Factors(Serving Area)

Serving Area	Tray preparation	Distribution	Return	Drinking fountain
Multipurpose	0.1155	0.1048	0.1130	0.0794
Independence	0.1701	0.1408	0.1397	0.1952
Convenience	0.2133	0.2472	0.2782	0.2472
Sanitary	0.3553	0.3672	0.3275	0.3577
Integration	0.1458	0.1400	0.1416	0.1211

In the case of cooking area, sanitary was the most important in all functional spaces, and the next order was convenience, independence, integration, and multipurpose.

As a result of individual interviews, a recent BTL dining facility built indoors by introducing a low-temperature refrigerator in the remnant treatment facility has only one door, so the doors are opened on both sides for the separation of copper when storing the remnants and taking them from the processing company. It was interpreted that it is necessary to increase convenience.

Table 5-5. Relative Importance of Evaluation Factors(Cooking Area)

Cooking Area	Kitchen	Dishwashing room	Leftover disposal
Multipurpose	0.1028	0.1023	0.0803
Independence	0.1761	0.2085	0.1677
Convenience	0.2155	0.2140	0.2516
Sanitary	0.3738	0.3673	0.3805
Integration	0.1317	0.1078	0.1199

In the case of the support zone, the convenience of the staff toilet and the loading dock was the most important, and the office and the storage were the most independent. In the case of the staff toilet, it was interpreted that it is desirable to have the staff toilet separately as it is, without being integrated with the public toilet in terms of convenience and sanitary. Offices were the most independent, which confirmed the necessity of space expansion, as mentioned in the analysis of relative importance of functional spaces. As a result of the on-site survey, there were many cases of placing container warehouses near dining facilities due to lack of storage space. In the case of loading docks, dining facility workers such as nursing homes prefer to consider vehicle entrances so that loading and unloading can be directly loaded from vehicles, while unnecessary slopes and sidewalks are often installed due to narrow area and road conditions. It is interpreted that important design is necessary.

Table 5-6. Relative Importance of Evaluation Factors(Support Area)

Support Area	Staff toilet	Office	Storage	Loading dock
Multipurpose	0.1488	0.1782	0.1234	0.1601
Independence	0.2235	0.3297	0.2843	0.2536
Convenience	0.2796	0.1913	0.2533	0.2696
Sanitary	0.2552	0.1871	0.1857	0.1966
Integration	0.0930	0.1137	0.1535	0.1201

5.3 Comprehensive Analysis of Results

The results of the analysis of the relative importance of the functional space and evaluation factors of the military dining facility are as follows. Most of the functional spaces of the military dining facility were found to have high sanitary importance, and the convenience was more important than the independence of each space in the public and serving areas that occupy most of the dining area. As a result, it was found that it is desirable to increase convenience by supplementing design guidelines rather than expanding the area of the relevant space by revising the floor area standards.

In the case of cooking areas, the independence of the dishwashing and the leftover disposal was high, and it was analyzed that the space expansion was necessary. There is a need to consider convenience.

Unlike other functional spaces, support areas showed greater importance of convenience and independence than sanitary. In the case of offices and storage, the space needs to be expanded, and the staff toilets should be separated from the copper line with the dining facility users according to the current regulations, and a separate public toilet should be installed if additional toilets are needed. In the case of loading docks, it was confirmed that convenience needs to be considered in consideration of the movement of housewives and workers.

Table 5-7. Comprehensive Results

Functional Spaces	Evaluation Factors	Relative Importance	Rank	Priority(Relative Importance)
Public Area	Access	0.2931	②	Sanitary > Convenience > Independence = Integration > Multipurpose (0.3225 > 0.2288 > 0.1597 = 0.1597 > 0.1293)
	Public Toilet	0.1637	④	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3652 > 0.2308 > 0.1749 > 0.1179 > 0.1111)
	Payment	0.1791	③	Convenience > Sanitary > Integration > Multipurpose > Independence (0.2734 > 0.2006 > 0.1953 > 0.1692 > 0.1615)
	Table Spaces	0.3640	①	Sanitary > Convenience > Integration > Independence > Multipurpose (0.4139 > 0.2580 > 0.1416 > 0.1229 > 0.0637)
Serving Area	Tray Preparation	0.1485	④	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3553 > 0.2133 > 0.1701 > 0.1458 > 0.1155)
	Distribution	0.4008	①	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3672 > 0.2472 > 0.1408 > 0.1400 > 0.1048)
	Return	0.2596	②	Sanitary > Convenience > Integration > Independence > Multipurpose (0.3275 > 0.2782 > 0.1416 > 0.1397 > 0.1130)
	Drinking fountain	0.1908	③	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3577 > 0.2472 > 0.1952 > 0.1211 > 0.0794)
Cooking Area	Kitchen	0.3973	①	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3738 > 0.2155 > 0.1761 > 0.1317 > 0.1028)
	Dishwashing room	0.3168	②	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3673 > 0.2140 > 0.2085 > 0.1078 > 0.1023)
	Leftover disposal	0.2859	③	Sanitary > Convenience > Independence > Integration > Multipurpose (0.3805 > 0.2516 > 0.1677 > 0.1199 > 0.0803)
Support Area	Staff toilet	0.2288	②	Convenience > Sanitary > Independence > Multipurpose > Integration (0.2796 > 0.2552 > 0.2235 > 0.1488 > 0.0930)
	Office	0.3939	①	Independence > Convenience > Sanitary > Multipurpose > Integration (0.3297 > 0.1913 > 0.1871 > 0.1782 > 0.1137)
	Storage	0.1638	④	Independence > Convenience > Sanitary > Integration > Multipurpose (0.2843 > 0.2533 > 0.1857 > 0.1535 > 0.1234)
	Loading dock	0.2135	③	Convenience > Independence > Sanitary > Multipurpose > Integration (0.2696 > 0.2536 > 0.1966 > 0.1601 > 0.1201)

5.4 Summary

Relative importance analysis by functional space and priority of evaluation factors were analyzed. Through this, comprehensive analysis was conducted to suggest ways to improve each functional space.

Chapter 6. Conclusion

This chapter summarizes the analysis of the functional spaces and evaluation factors using AHP, and describe the contribution, limitation and further study of the research

6.1 Summary and Contribution

Military dining facilities are very important spaces for the health of soldiers and provide combat power in case of emergency, but because they are not directly related to combat, they are less concerned than operation / combat facilities or other administrative / welfare facilities, and the defense military standards are frequently revised. Accordingly, in this research, military dining facilities were divided into public areas (access, public toilet, payment, table spaces), serving areas (tray preparation, distribution, return, drinking fountain), cooking areas (kitchen, dishwashing room, leftover disposal), and support areas (staff toilet, office, storage, loading dock). The evaluation factors such as multipurpose, convenience, sanitary and integration were selected and stratified and AHP analysis was performed.

In the existing military facility standards, only the table spaces kitchen, storage, service area, and dishwashing room consisted of space, so that the actual dining facility space plan considering the user preference and usability has not been achieved. There are many cases where people are urged to meet the determined total area and omit essential elements such as offices. In this research, we suggested guidelines for future revision of defense military standards by presenting functional spaces for leftover disposal and staff offices that were actually necessary but were not included in the defense military facilities standards.

In addition, the results of this research can be applied not only to military facilities but also to school cafeterias where group meals are served.

6.2 Limitation and Further Study

This research analyzed only the priority according to each functional space and evaluation factor. Therefore, if the research on user satisfaction survey according to the actual area change after the revision of the relevant standard is conducted, it can be verified effectively.

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Enforcement Decree of the State Property and Goods Management Act

Law on the Construction of Military Facilities / Enforcement Decree / Enforcement Rules

Appendix

A. AHP Questionnaire

A.1. Personal Information and Table of Contents

A.2. Instruction for Questionnaire Response

A.3. Questionnaire Content

A.4. Form Responses

● **설문작성 시 유의사항** ●

첫째, 본 설문지는 식당 사용 시 중요한 항목에 대한 가중치를 판단하는 것입니다.

둘째, 평가 항목 간 비교는 평가항목 A가 B에 비해 상대적으로 얼마나 중요한지(또는 적절한지)를 평가하는 것입니다.

셋째, pp. 3 ~ 4에서 제시하는 평가 요령, 평가항목의 구조와 평가내용, 용어의 정의를 꼭 읽어보시고 설문에 응해 주십시오.

설문 목 차

I. 설문 응답 시 유의사항	3
II. 설문내용	4
III. 설문지	5

A.2. Instruction for Questionnaire Response

I. 설문응답 시 유의사항

1. 응답 예

평가 시 항목 A가 항목 B보다 극단적으로 중요하다고 생각하시면 아래와 같이 기입하면 됩니다.

표 1 평가의 예

A	(중요)	← 동등 → 중요								B
	5	4	3	2	1	2	3	4	5	
	√									

표 2 척도의 예

동등	약간 중요	강하게 중요	매우 강하게 중요	극단적으로 중요
1	2	3	4	5

2. 응답 일관도

AHP 분석에서는 분석의 부산물로 비일관도지수가 생성됩니다. 비일관도 지수가 **0.10이상**이 될 경우 **응답결과를 신뢰할 수 없다고 판단되어 재설문**하게 됩니다. 비일관도 지수가 높게 나오는데는 크게 다음과 같이 두 가지 경우가 해당됩니다.

<p>예)</p> <ol style="list-style-type: none"> 1. $A > B$: A가 B보다 2배 중요하다고 응답 2. $A \gg C$: A가 C보다 4배 중요하다고 응답 <p style="text-align: center;">→ $B > C$라고 응답해야 함.</p>

[원인 1] 서수적 일관성 결여 : $A > B > C$ 의 순위가 바뀌게 응답

[원인 2] 기수적 일관성 결여 : 위 예에서 B가 C보다 9배 중요하다고 응답할 경우

A.3. Questionnaire Content

II. 설문내용

1. 시설별 기능공간의 상대적 중요도

군 취사식당 4개 시설 기능공간의 상대적 중요도와 기능공간별 중요 평가요소의 상대적 중요도

2. 대상시설물 및 기능공간 분석결과

사전 대면조사 인터뷰를 통해 각 시설별 기능공간을 표3 과 같이 조사/분석함

표 3 시설별 기능공간 분석결과

시설명	기능공간													기능공간 평가요소	
	출입	화장실	계산	테이블	식기	배식	퇴식	식수대	취사	세척	잔반	사무	창고 (보관)		적하역
공공 구역	√	√	√	√											1. 다목적성 2. 독립성 (공간) 3. 편의성 4. 위생 5. 통합 운용성
사범 구역					√	√	√	√							
취사 구역									√	√	√				
지원 구역		√										√	√	√	

3. 용어의 정의

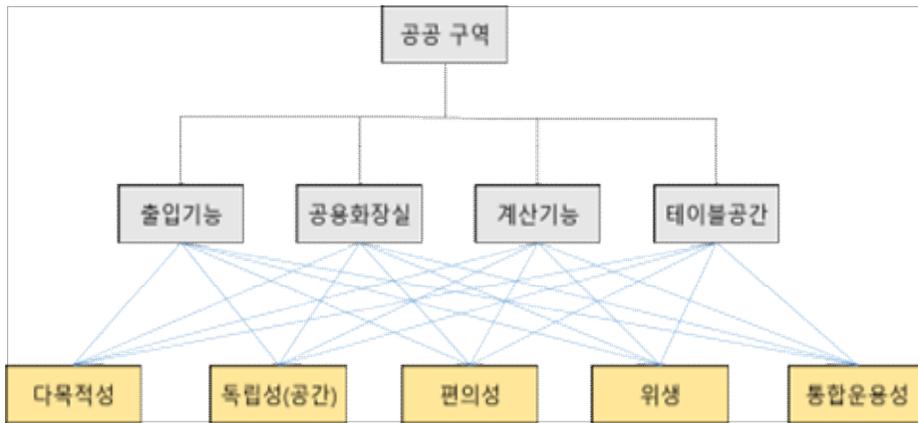
- 다목적성 : 다양한 기능을 한 장소에서 처리할 수 있는 기능
예) 식사, TV 시청, 집합, 교육 등을 식당에서 처리
- 독립성(공간) : 독립적 공간구성(확보)
- 같은 공간(면적)에서 인당 테이블공간이 증가하면 상대적으로 대기열 및 복도의 폭은 감소하여 편의성이 감소
- 편의성 : 이동구간, 대기구간 등에서 쉽고 용이함을 느끼게 해주는 특성
- 테이블 간 복도폭이 증가하면 편의성은 증가하나 독립성은 감소
- 위생 : 식당 구성의 중요 요소로 식사의 질과 장병의 건강을 결정하는 척도
- 통합운용성 : 복수 공간 동일 기능을 한 공간에서 처리하는 기능
예) 공용화장실과 직원화장실을 분리하지 않고 함께 사용시 통합운용성은 증가하고 위생은 감소

A.4. Form Responses

Ⅲ. 설문지

지금부터 각 시설별 기능공간의 상대적 중요도와 각 기능공간별 평가요소의 상대적 중요도를 평가합니다. 중요하게 생각하는 사항에 표시(√ 또는 ○) 바랍니다.

1. 공공 구역



1-1. 기능공간의 상대적 중요도

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
출입기능										공용화장실
출입기능										계산기능
출입기능										테이블공간
공용화장실										계산기능
공용화장실										테이블공간
계산기능										테이블공간

1-2. 기능공간별 평가요소의 상대적 중요도

A. 출입 기능(공간)

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
다목적성										독립성(공간)
다목적성										편의성
다목적성										위생
다목적성										통합운영성
독립성(공간)										편의성
독립성(공간)										위생
독립성(공간)										통합운영성
편의성										위생
편의성										통합운영성
위생										통합운영성

B. 공용화장실

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
다목적성										독립성(공간)
다목적성										편의성
다목적성										위생
다목적성										통합운영성
독립성(공간)										편의성
독립성(공간)										위생
독립성(공간)										통합운영성
편의성										위생
편의성										통합운영성
위생										통합운영성

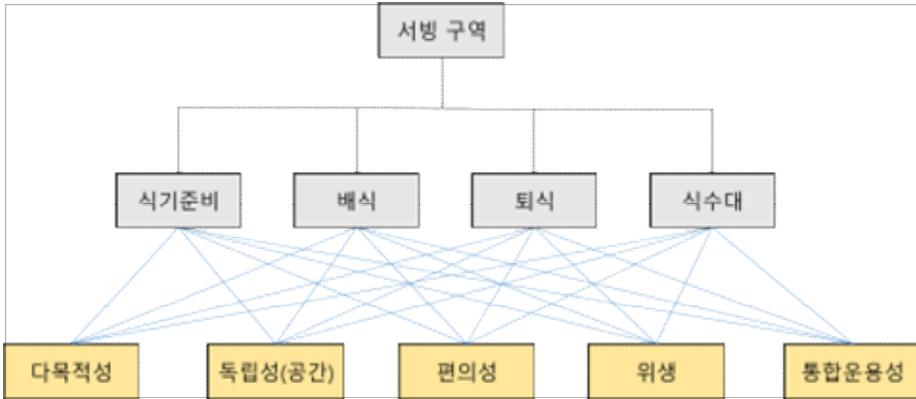
C. 계산기능(공간)

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
다목적성										독립성(공간)
다목적성										편의성
다목적성										위생
다목적성										통합운영성
독립성(공간)										편의성
독립성(공간)										위생
독립성(공간)										통합운영성
편의성										위생
편의성										통합운영성
위생										통합운영성

D. 테이블공간

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
다목적성										독립성(공간)
다목적성										편의성
다목적성										위생
다목적성										통합운영성
독립성(공간)										편의성
독립성(공간)										위생
독립성(공간)										통합운영성
편의성										위생
편의성										통합운영성
위생										통합운영성

2. 서빙 구역



2-1. 기능공간의 상대적 중요도

항목	중요		← 동등					→		중요	항목
	5	4	3	2	1	2	3	4	5		
식기준비											배식
식기준비											퇴식
식기준비											식수대
배식											퇴식
배식											식수대
퇴식											식수대

2-2. 기능공간별 평가요소의 상대적 중요도

A. 식기준비(공간)

항목	중요		← 동등					→		중요	항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

B. 배식(공간)

항목	중요		← 동등				→		중요		항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

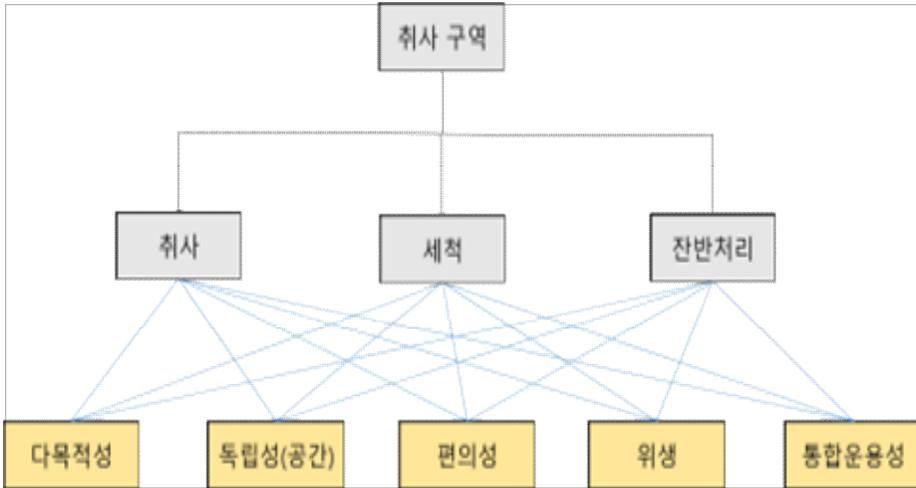
C. 퇴식(공간)

항목	중요		← 동등				→		중요		항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

D. 식수대(공간)

항목	중요		← 동등				→		중요		항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

3. 취사 구역



3-1. 기능공간의 상대적 중요도의 상대적 중요도

항목	중요		← 동등					→		중요		항목
	5	4	3	2	1	2	3	4	5			
취사											세척	
취사											잔반처리	
세척											잔반처리	

3-2. 기능공간별 평가요소의 상대적 중요도

A. 취사(공간)

항목	중요		← 동등					→		중요		항목
	5	4	3	2	1	2	3	4	5			
다목적성											독립성(공간)	
다목적성											편의성	
다목적성											위생	
다목적성											통합운용성	
독립성(공간)											편의성	
독립성(공간)											위생	
독립성(공간)											통합운용성	
편의성											위생	
편의성											통합운용성	
위생											통합운용성	

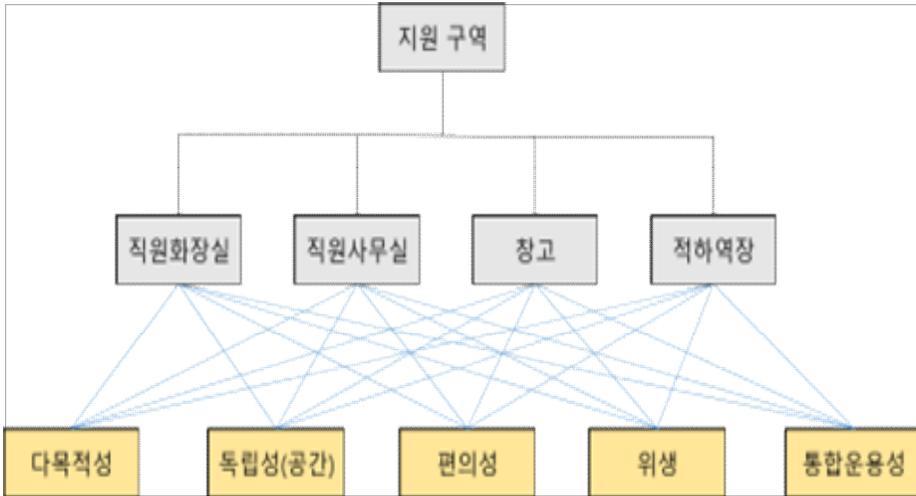
B. 세척(공간)

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
다목적성										독립성(공간)
다목적성										편의성
다목적성										위생
다목적성										통합운용성
독립성(공간)										편의성
독립성(공간)										위생
독립성(공간)										통합운용성
편의성										위생
편의성										통합운용성
위생										통합운용성

C. 잔반처리(공간)

항목	중요		← 동등 →					중요		항목
	5	4	3	2	1	2	3	4	5	
다목적성										독립성(공간)
다목적성										편의성
다목적성										위생
다목적성										통합운용성
독립성(공간)										편의성
독립성(공간)										위생
독립성(공간)										통합운용성
편의성										위생
편의성										통합운용성
위생										통합운용성

4. 지원 구역



4-1. 기능공간의 상대적 중요도

항목	중요		← 동등				→		중요		항목
	5	4	3	2	1	2	3	4	5		
직원화장실											직원사무실
직원화장실											창고(보관)
직원화장실											적하역장
직원사무실											창고(보관)
직원사무실											적하역장
창고(보관)											적하역장

4-2. 기능공간별 평가요소

A. 직원화장실

항목	중요		← 동등				→		중요		항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

B. 직원사무실

항목	중요		← 동등					→		중요	항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

C. 창고(보관)

항목	중요		← 동등					→		중요	항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

D. 적하역장

항목	중요		← 동등					→		중요	항목
	5	4	3	2	1	2	3	4	5		
다목적성											독립성(공간)
다목적성											편의성
다목적성											위생
다목적성											통합운영성
독립성(공간)											편의성
독립성(공간)											위생
독립성(공간)											통합운영성
편의성											위생
편의성											통합운영성
위생											통합운영성

5. 다음 사항에 대해 개인의 의견을 자유롭게 기술하여 주십시오.

1) [공통]

미군의 경우 식당 공간에 공용화장실과 직원화장실을 구분하여 별도로 설치하도록 규정하고 있는 반면, 우리군의 국방군사시설기준은 서비스면적 내에 화장실 등을 포함하도록 되어 있고 별도의 분리기준은 없습니다. 취사식당에 화장실을 별도로 설치하는 것에 대하여 어떻게 생각하십니까? 그 이유는?

2) [공공구역]

식당을 식사할 때 말고 다른 목적으로 사용한 경험이 있습니까? 있다면 그 목적과 빈도가 어떻게 됩니까?
(예시 : 일과 후 TV 시청 또는 학습 장소로 사용, 주 1~2회)

3) [서빙구역]

식당에서 식사 시 식기를 받고 배식, 식사 후 퇴식, 식수대에 이르는 동선에서 가장 불편했던 점과 개선해야할 사항이 있다면 기술하여 주시기 바랍니다.

4) [취사구역] (해당구역 근무경험 있는 사람만 답변)

현재 대다수의 우리군 식당은 야외 분리수거장의 잔반수거통에 잔반을 모아놓고, 외부 위탁업체가 수거하는 방식으로 잔반을 처리하고 있습니다. 실내에 별도의 잔반처리실 공간을 마련하는 것에 대해 어떻게 생각하십니까? 그 이유는?

5) [취사구역] (해당구역 근무경험 있는 사람만 답변)

취사장에서 가장 좋아서 불편하다고 느낀 구역과, 너무 넓어서 불필요한 공간이라고 생각되는 구역이 있다면 알려주시기 바랍니다.

6) [지원구역] (해당구역 근무경험 있는 사람만 답변)

직원사무실과 직원휴게실을 사용하면서 불편한 점이 있다면 알려주시기 바랍니다.

7) [기타]

기타 군 취사식당 공간 개선을 위한 의견 및 건의사항이 있다면 자유롭게 기술하여 주시기 바랍니다.

국 문 초 록

군 병영 내에서의 식사는 전투력 복원과 사기 증진을 위한 중요한 요소이다. 군의 취사식당은 식사뿐만 아니라 TV 시청, 교육, 동아리 활동 등의 소모임 기능을 수행한다. 식당에서 근무하는 근무자(조리부사관/병/군무원 등)들은 일과시간 대부분을 식당에서 보내며 취사, 식기세척, 잔반 처리 등의 임무를 수행하고 휴식도 취한다. 이처럼 군의 취사식당은 여러 복합적인 기능을 수행하는 공간으로 취사식당 건축 계획 시에는 이러한 다양한 기능들을 고려한 공간계획이 이루어져야 한다.

또한 집단생활을 군부대의 특성상 식중독 등의 질병 발생 시 전염의 우려가 높으며 이는 곧 전투력 하락으로 직결된다. 식당에서의 위생관리의 중요성은 아무리 강조해도 지나치지 않으며, 위생 관리체계인 HACCP(Hazard Analysis and Criteria Control Point System)에서는 식품을 다루는 환경에 관하여 효과적인 위생관리를 위해서는 공간의 개선이 선행되어야 함을 강조한다. 공간구성이 적절하지 못하면 위생원칙에 반하는 동선을 유도하게 되어 위생관리가 어려워지고, 식당 구성공간에 위생개념이 고려되면 위생원칙을 준수하기 쉬워지고 위생관리가 편해지므로(Lee, 2011), 기능공간 계획도 이를 고려해야 한다.

그러나 군 취사식당의 공간을 계획함에 있어 기준이 되는 국방군사시설기준은 표준 평면도를 단순 분석하여 인당 규모에 맞도록 한 계산식으로만 되어 있다. 이에 따라 전체 면적에서 줄여야 할 공간이 있을 때 우선순위에 대한 기준이나 기능공간에

대한 고려 없이 눈에 보이는 테이블 공간은 남겨두고 보이지 않는 사무실 삭제, 휴게실 축소 등을 통해서 전체 면적을 맞추는 등의 부작용이 존재하는 것이 현실이다.

국내 공공시설 취사식당의 건축계획은 식당 내부의 세부공간 기능별 특성을 고려하지 않고 공무원 수 전체 인원에 대한 비율에 해당하는 전체면적만을 제시하는 수준이고, 미군의 경우는 Public area, Serving area, Preparation area, Support area 등의 기능공간 분류를 통해 한국군보다 세부적인 기능공간별 바닥면적을 제시하고 있으나 주·부식, 취사방법 등의 차이로 인해 적용하기에는 제한사항이 있다.

이에 따라 본 연구에서는 군 취사식당을 대상으로 취사식당 근무자가 중요시 여기는 공간의 우선순위를 바탕으로 고유 기능에 따른 분류를 통해 기능공간별 특성을 분석하고자 한다. 이는 추후 국방군사시설기준의 건축바닥면적기준 개정 시에 관련근거로 활용할 수 있는 지표가 될 수 있고, 한국군 특성과 근무자 만족도를 고려한 효율적인 공간계획으로 사용성을 향상시킬 수 있다. 추가적으로 본 연구의 결과는 군 취사식당 뿐만 아니라 단체급식이 이루어지는 학교 식당 등으로 확장하여 적용할 수 있다.

주요어: 군 취사식당, 계층화 분석 과정, 기능공간, 평가요소, 국방군사시설기준

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