PREPARETION OF SAFE FOODS IN HOSPITAL KITCHEN AND PATIENT NUTRITION

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Abstract

Food service, which is provided as a common service in the organization of a hospital, is also considered as a medical service. Food service in the hospital is for feeding the staff and also contributes to the treatment process of the patients. Food service at hospitals, apart from the production and distribution process as a catering service also includes controlling raw materials and testing them for their acceptance. All the processes such as selection of menu, procurement of materials, preperation of the meals, and presentation are highly important in food services.

This study has been carried out at a public hospital in Istanbul in order to determine the convenient type of diets for patients and the conditions for assurance of food safety in hospital kitchens for preparation of safe foods for personnel and patients. Food production area of the hospital has been examined according to steps of ISO 22000 (HACCP) system and were followed whether the system rules are applied or not. As it is known, assurance of food safety systems is elimination and prevention of the contamination of biological, physical and chemical hazards from foods. In order to produce safe foods in hospital kitchens hygienic conditions, good infrastructure and well trained personnel are needed and ISO 22000 (HACCP) requirements should be followed.

Keywords: *Diet, food safety, HACCP, hospital food service, patient nutrition*

1. Introduction

One of the most important services provided by the hospitals is food (catering) service. Food service is also considered as one of the medical services for patients in order to support the treatment of patients. It is important to create a suitable diet for both the medical prosecure and the type of illness of the patient for the treatment. Nourishment is the prosecure of taking the right products for growth, strength and daily needs of the body. The ages, sexes and the physical condition of the patients should be taken into consideration for healthy nutrition. People eat obligatory food at places which serve for huge numbers of people like hospitals. That is why there are some regulations for service presentation in a lot of countries. (Baysal et al., 1994)

Previously, permanent personnel of Ministry of Health used to prepare and present food services in the hospitals belong to the government, but now the same job is done by the companies which provide sub-contracted outsource workers. The supervision is completed by a commission which includes members chosen from permanent staff of the hospital.

For the patients staying at the relevant hospital, the kitchen offers full day service by serving 3 main meals and 3 refreshments in a single day. For the staff, there are three meals as breakfast, lunch, and dinner. The menus are created under the control of dieticians monthly and freshness of these suitably prepared meals is checked continuously. Naturally, it is expected to assure the food safety for the production period of the food which is served to the patients and staff.

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Food safety is a chain system constisting of preparation, storage and presentation to the end-user without any biological, physical and chemical hazards and safe food is the food which is free from all kinds of hazardous subtances for consumption. There are a number of food safety management systems for the assurance of food safety in a systematic way. Controlling the raw material to provide food safety in kitchens eliminates the risks which can be faced at previous levels of production. After that, the taken precautions at the kitchen environment provide food safety. Different safe food management systems have been created for safe food production and one of the most efficient and the most common of these is HACCP (Hazard Analysis and Critical Control Points) System.

The food safety standards which are followed in Turkey and in the world can be sorted as follows (Anon., 2007c):.

- The standarts on content and methods of food safety precautions
- The standards used for the production, storage and distribution tools and machines for foods
- The standards for microbiology of food
- The standards for food composition and ingredients.

ISO 22000 Food Safety Management System has been developed for obtaining safe food and it is used worldwide. HACCP principles were taken into consideration while it was developed. Apart from these, ISO 9001:2000 Quality Management System Standards for total quality management and, ISO 13001 Environment Management System Standards for the protection of the environment as well as different kinds of systems can be used (Anon., 2007c).

HACCP System has 7 fundamental principles in worldwide applications. These are:

- Determining the hazards
- Determining Critical Control Points
- Determining Control Criteria and Limits
- Determining Monitoring System
- Determining Corrective Actions
- Verification and Auditing
- Records and Documentation

In an establishmet, the efficency of food safety system should be controlled by the top management continuously at every level of these procedures. Besides, the senior management should provide updates and improvement reports of the system by corrective actions.

Food Originated Health Hazards

A lot of hazards threatening food safety causes food to damage our health. Physical, chemical and biological hazards are the main reasons seen as a threat to food safety.

Physical contaminants in foods can be sorted as shattered glasses, plastic, bon, stone, dusty, etc. These can be contaminated by either environment incidentally or on purpose. These carry the risk of contaminating the food while providing raw material; during production, storage, packaging, transportation and consumption of foodstuffs.

Chemical hazards are originated from chemical substances which contaminate foods during primary production, storage, or heavy metals contaminated by environmental pollutants like mercury, lead and cadmium, dioxins, agricultural pesticides, detergent wastes passed from poorly washed dishes, the chemicals contaminated by food packaging materials, veterinary drugs and overdosage use of food additives (Giray and Soysal, 2007; Erkmen and Bozoğlu, 2008).

Biological contaminants of food can be divided into three categories. First one is the toxic chemical substances naturally formed in the food itself. For example, solanin which is found on potatoes which become green and sprouted and toxic mushrooms. The second group consists of fast replicated microorganisms, viruses and microbial toxins resulting from the lack of sufficient production environment and wrong storage techniques.

Among these, the most dangerous one for human health are bacteria. Some of these are Pathogenic Escherichia coli, *Salmonella, Bacillus cereus, Staphylococcus aureus, Clostridium botulinum, C. Perfringens and Listeria monocytogenes* (Ministry of Health, 2007). These can contaminate the food by microorganisms, dust, soil, air, bugs, pesticides, raw food, wastes, tools used at production and via human. There are a lot of patogen bacteria on human body. Throat, nose, skin, hand, intestines and stools are loaded with bacterias. Because of that, most of the pathogen bacteria contaminate the food by the human himself (Erkmen and Bozoğlu, 2008).

Nutrition of In-patients

Nutrition programmes of in-patients in hospitals are created by taking clinical variables into consideration such as the physical activity of the patient, newly-developed complications, changes on body temperature and infections.

The factors affecting the total energy consumption of the patient:

- Resting energy consumption
- Consumed energy by physical activity
- Diet-induced thermogenesis

Apart from these, septisemi, trauma, burns and illnesses like hipertiroidi can affect the metabolic rate and by doing so it can cause changes regarding the need for energy.

Some of the researches show that energy need of in-patients increases at first, then it reaches the maximum point and decreases slowly (Ishibashi, 1998; Plank, 2001). We can understand that energy need of a patient can be variable, that is why the patient needs to be examined and suitable nutritional regulations should be made.

Picture 1. Food service to a In-patient

The main objective of this study is to investigate the food safety conditions and discuss the ISO 22000 (HACCP) system criterias established at hospital kitchens in order to assure the food safety. In addition, menu planning for patient nutrition, staff nutrition and treatment process have also been investigated. The present study has been carried out at a hospital in the city of Istanbul.

2. Material and Methods

This study has been carried out by taking the suitability of the hospital, the kitchen and patient nutrition process into consideration at a hospital in the city of Istanbul. The kitchen of this hospital provides service for a total of 1000 people divided as breakfasat, lunch and dinner in a day. There was daily breakfast, lunch and dinner services for in-patients. In addition, hospital personnel were also making use of these services.

Food preperation process is carried out by master chefs in the kitchen of the hospital and the supply is provided weekly. The menus are normally divided into two as “normal food” and “diet food”. Furthermore, diet patients are given a service of refreshments three times a day. Daily breakfast, lunch and dinner menu are examplified below in Table 1.

Table 1. Daily Breakfast, Lunch and Dinner Menu

BREAKFAST	**DIET BREAKFAST**
White Cheese / Cheddar Cheese	White unsalted cheese
Black and green olives	Black and green olives
Jam	Tomatoes / Cucumber
Tomatoes / Cucumber	Cracker
Boiled Eggs	Milk Tea
Tea	
LUNCH	**DIET LUNCH**
Vegetable soup	Vegetable soup
Boiled meat	Boiled meat
Bulgur pilaf	Yoghurt
Salad	Salad
DINNER	**DIET DINNER**
Wedding soup	Wedding soup
String beans with meat	Leeks with meat
Rice pilaf	Yoghurt
Cucumber with yoghurt	Sour apple

Foods are cooked by a team of 5 people consisting of a head chef, two chefs and two assistant chefs. Kitchen staff is totally 18 people and they work under the control of a food engineer. The products carried to the kitchen section are transferred into suitable storage rooms, again, under the control of the food engineer. Kitchen settlement plan is given below (Figure 1) and a view from the kitchen is given in Picture 2.

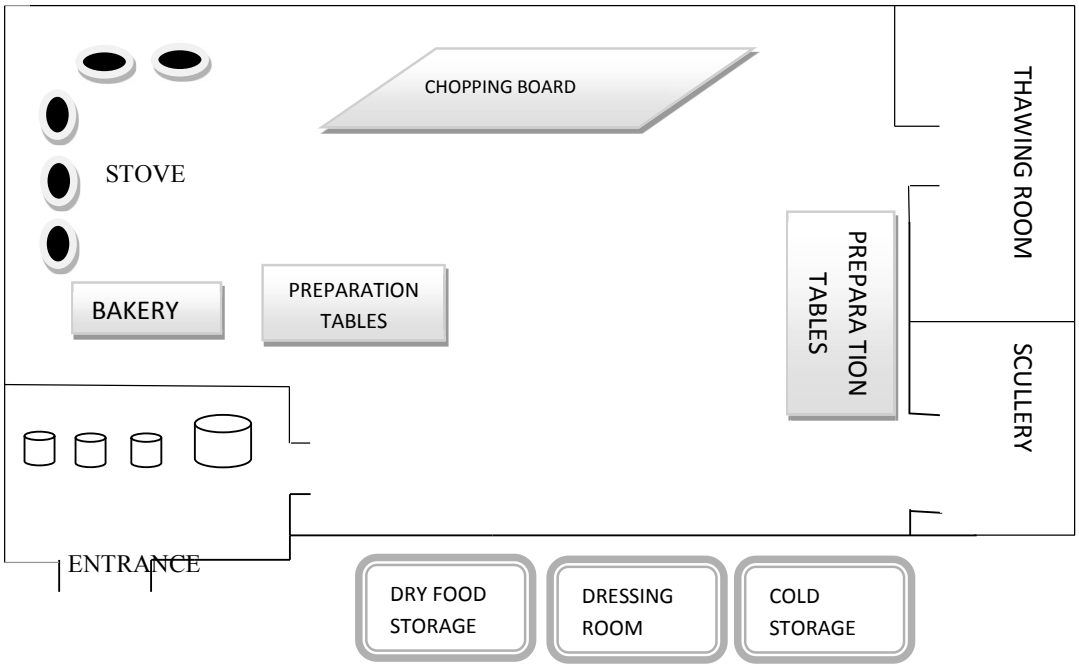

Figure 1. Hospital Kitchen Plan

Picture 2. Food preperation Area

Normal and diet menu examples provided at the hospital as meals during a day are given in Table 2.

Table 2. Weekly Menu Example Implemented at the Hospital

		Breakfast	Lunch	Dinner
Monday	**Normal**	White cheese Mixed olives Butter Honey Tea/Milk	Wedding soup Dried beans Rice pilaf Pickle	Creamed M. Soup Chicken Shish potato salad Ayran
	Diet	Unsalted cheese Mixed olives Molasses with Tahini Milk	Tomato soup Boiled chicken Bulgur pilaf Yoghurt	Yoghurt soup Green bean pasta sour fruit
Tuesday	**Normal**	Cheddar Cheese Mixed olives Tomatoes Peanut butter Tea	Vermicelli Soup Chicken with bechamel sauce Rice Pilaf Ayran	Vegetable soup Kebab with vegetables Rice pilaf Salad
	Diet	Unsalted cheese Mixed olives Jam Tea/ Milk	Wedding soup Staffed squash Kuskus pilaf Yoghurt	Vegetable soup Sauce meatballs Noodles Green salad
Wednesday	**Normal**	White cheese Mixed olives Cucumbers Molasses with Tahini Tea	Lentil soup Green peas with meat Bulgur pilaf Yoghurt	Chicken consomme Spinach Pasta with sauce Yoghurt
	Diet	Cream cheese Mixed olives Boiled egg Tomatoes Diet milk	Broccoli soup Green peas with meat Bulgur pilaf Yoghurt with fruit	Chicken consomme Cabbage Stew with minced meat Yoghurt
Thursday	**Normal**	Cheddar cheese Mixed olives Cucumbers Peanut Butter Tea	Yoghurt soup Hasanpaşa Meatball Rice pilaf Salad	Creamed M. Soup Fish Salad Dessert
	Diet	Unsalted cheese Mixed olives Tomatoes Crackers Tea/ diet milk	Tomato soup Boiled meat Kuskus Pilaf Yoghurt	Yoghurt soup Spinach with minced meat Pasta Yoghurt

Friday	**Normal**	White cheese Mixed olives Boiled egg Jam Tea	Chicken consomme Ispanak Kol böreği Cold stewed fruit	Chicken consomme Mixed fries Pasta with cheese Dessert
	Diet	Creamed Cheese Mixed olives Tomatoes - Crackers Diet Milk	Mushroom soup Eggplant with minced meat Noodles Ayran	Spinach soup Meatballs Bulgur pilaf Yoghurt
		Breakfast	Lunch	Dinner
Saturday	**Normal**	Cheddar cheese Mixed olives butter honey cucumber tea	Yoghurt Soup Meatballs+Potatoes Rice Pilaf Cacık	Wedding soup Mixed Stuffed Peppers Pasta Fruit
	Diet	Unsalted cheese Mixed olives Biskuits Diet milk	Vermicelli Soup Boiled chicken Kuskus pilaf Cacık	Wedding soup Mixed stuffed Peppers Yoghurt Green Salad
Sunday	**Normal**	Creamed Cheese Mixed olives Tomatoes-Cucumber Molasses with Tahini Tea	Tomato Soup Wrapped rice Manti fruit	Vegetable Soup Roasted meatball Rice pilaf Yoghurt
	Diet	Creamed cheese Mixed olives crackers cucumbers Diet milk	Yoghurt soup İzmir meatballs Bulgur pilaf Ayran	Chicken consomme M. saute with meat Noodles Yoghurt

3. Results

The studies have have been started in order to establish the HACCP system in a fully functional governmental hospital in Istanbul. It was seen that for every level from raw material supply to food service, the steps were taken according to the food safety rules and the HACCP system was established to a large extend. Despite the fact that the infrastructure of the hospital was not adequate for HACCP system applications, the available resources were efficiently used for safe food production.

In the hospital building, kitchen is located at the lowest floor of the building and the area is not big enough, but these haven't had hazardous effects on safe food production. When the musts are handled, HACCP System will start its applications systematically.

Maximum population of in-patients and their relatives who eat at the hospital during a day are about 200 people but only a small part of this population eat diet food. Since the consumer population is not so high, it makes the preparation

of safe food easier. Patients are mostly enjoying their foods and that can be seen as an indicator of pruducing good food.

At the hospital where the study was being carried out, not all the HACCP Principles can already be carried out due to the fundamental system deficiencies. Improvements were made in the area for the efficient use the HACCP system. The HACCP Principles currently applied are given below:

- Determination of the Hazards
- Determination of the Critical Control Points
- Defining the Corrective Actions
- Verification and Auditing
- Records and Documentation

To be able to decide the monitoring criteria, limits and control system, it is essential to renew the infrastructure of kitchen section and move it to somewhere else, that is why it can't be applied well. Verification and audition processes are partly applied with available stuff. Apart from this, the quality department of the hospital supervises the kitchen and dining hall in terms of the Quality Standards demanded by the Ministry of Health.

In the food preparation area of the hospital where the study has been carried out, there are astorage rooms for foods such as cold storage, two dry food stores and 2 freezers for pereservation of frozen foods. The products (i.e. raw materials), to be used for food preperations are supplied for the hospital weekly and kept in suitable temperatures. Temperatures of rooms are checked two times a day (one in the morning and one in the evening) by checking a tracking chart. The temperature of cold storage should be about +4 ^{o}C, freezers should be about -18 ^{o}C and dry food storage rooms should be between 10-15 ^{o}C with a relative humidity of 60-65%.

Meat products and frozen foods are kept in freezers and they are consumed by taking cold chain system into consideration. Cold storage room is used for fresh fruits and vegetable products, milk and milk products. Legumes, pasta and oil products are kept in dry food stores. First comes, first goes storage rule is applied to the storages. By doing that, the products are always kept fresh and their high quality is preserved.

Dining hall of the hospital is checked everyday for its cleaning status and hygienic conditions. Hygienic Control Charts are kept by the management. Table 3 shows daily hygien tracking chart for the kitchen.

Table 3. Daily Hygiene Tracking Chart for the Kitchen

	DAILY KITCHEN HYGIENE TRACKING CHART								
WORK DONE	**PERIOD**	**DATE**	**TIME**					**CONTROLLER**	**APPROVED**
FLOOR - SURFACE HYGIENE	3 TIMES		07:00		14:00		20:00		
ULTRA PURIFICATION OF SURFACES	2 TIMES		07:00		15:00				
GARBAGE DISPOSAL	3 TIMES		10:00		14:00		18:30		
CLEANING OF THE MACHINES	2 TIMES		10:00				18:30		
HYGIENE OF TOOLS AND EQUIPMENTS	3 TIMES		07:00		14:00		20:00		

Meals which are prepared daily for the menu are checked for their suitablity and then they are served. Food is checked by the food engineer and noted on food tracking form. Food samples are taken daily and kept +4°C as control samples. Samples are destroyed after waiting 72 hours. Food tracking form is given below at Table 4.

Table 4. Daily Food Tracking Form

	DAILY FOOD TRACTING CHART						
DATE:…../……./20….							
The menus given below are appropriate by ourselves for distribution.							
LUNCH VARIETY	**IS IT APPROPRIATE TO THE MENU?**		**HEAT**	**TASTE**	**VISUAL**	**HYGENE**	**OTHER**
	YES	NO					
RESULT - EVALUATION - SUGGESTION							

For in-patients, 3 main meals and when necessary, refreshments should be served during the day. At the process of service, there are important rules to be taken into consideration;

- The cleaning of the tools used for service such as fork, spoon and plate is of high priority.
- Lined, cracked or broken tools shouldn't be used.
- During service, the food is mixed periodically to make every part of it hot.
- It is suitable to hold the bottom parts of plates and glasses and avoid touching the mouth parts.
- Cooked food should be held for maximum of two hours at room temperature.
- Freshly cooked foods shouldn't be mixed with old ones.
- Spice bottles used at food service should be cleaned regularly.
- Bread is served while being protected from external factors such as dust and moisture.
- Cooked meals are kept over 65°C on water bath and serviced hygienically. By doing that, patients and staff are serviced clean hot meal.
- Napkin, wet towels and toothpicks should be presented during service.
- Isolated patients who have contagious illnesses should be provided disposable plate, fork and spoon.
- Food should be carried with protected moving tools.

The Variety of Menu Prepared in Hospital Kitchen

The diet program for the patients is prepared by taking their illneses, physical and psychological situations into consideration. Lack or imbalance of nutrition may become a very vital problem for the

patients. That is why these diets should be planned and prepared very strickly and they should be checked (Özbek and Fidan, 2010).

The content of the diet should be balanced in terms of protein, carbohydates and fat contents. While doing this, patient's illness and whether s/he has some restriction are considered. For example, carbohyrates can be restricted and fat can be increased for the patients who have KOAH (Özbek and Fidan, 2010). For lactose intolerance patients, dairy products are removed from their diets. If the patient has a problem with his/her digestive system, stiffness of the food can be arranged. By taking the the type of illness into consideration, special diet grouping is made. For the patients who will have an operation, fully functional digestive function is waited prior to giving food. Gas generation from intestines means they start working. After this level, transition diets are applied, then the regular nutrition is started with their own diet. Unless they need to have a special diet, they are given a standard diet having all nutrient groups.

At the hospital, there were some studies on patients who eat diet food and the results are examined as long as the patient stays in the hospital. For example, the system is designed by the results of Glucose, cholesterol and LDL level of the patients who are diagnosed with diabetes mellitus. Blood samples of these patients are the biochemistry group samples and they are analysed by fully automatic AU680, the auto analyser machine which belongs to the hospital where the study is carried out. The system can perform 3 analyses (Glucose, cholesterol and LDL) at once using the same sample. The system is capable of analysing the blood samples of 1200 individuals in one hour. Blood samples are taken when the patients are hungry.

For the patients suffering from *Diabetes Mellitus* who have high blood glucose values, first sugar regulation is implemented, then they are placed in the hospital to be monitored, and then suitable diet is prepared by taking their calorie needs into consideration. Following their stay at the hospital, the in-patients had their suitable diet and 15 minutes walk after every meal, and they had a blood test prior to checking out. In the studied blood tests, there were meaningful recovery seen on their glucose, cholesterol and LDL levels. This situation pointed out that the diet is very important for the patients of *diabetes mellitus.*

Liquid Food Diet

Liquid food is used as the first step for starting eating after the operation and continues until the gas comes out. At room temperature, these foods can keep their liquidity and they consist of liquid grainless ingradients. They don't need to have much nutrient. For example,

Breakfast: Petit Beurre biscuits and tea

Lunch and Dinner: grainless soup, chicken consomme, grainless cold stewed fruit.

Soft Juicy Diet

Soft juicy foods have soft consistency, strongly fibrous and they are easily chewed, easily digested without smell. If the patient is going well, raw vegetable and fruits can be added in the diet. These type of foods can be used for the in-patients having acute infection cases, some gastrointestinal disorders and after operations. In this diet, chicken, fish and meat is not served to in-patients. Also, the foods such as milk, yoghurt, fresh fruits and vegetables are not given to patients because they generate gas. At breakfast, crackers, cheese and honey can be served. Soup, which doesn't cause gas, cream potatoes, rice pudding, grained coldstew fruit or grissini can be added to the menu.

Diarrhea Diet

Patients suffering from diarrhea are encouraged to consume a lot of liquids. Consuming fat is results with the increasing of diarrhea, that is why the foods with lower fats and oil level should be chosen. The meal can be prepared by choosing foods such as boiled chicken meat, non fat pasta, non fat yoghurt or ayran. An example of Diarrhea Diet Menu is given in Table 5.

Table 5. Diarrhea Diet Menu

DIARRHEA DIET	
Breakfast	Non fat white cheese Light tea (without sugar) Bread
Refreshment	Banana or sour green apple
Lunch	Soup (i.e. potato soup) Boiled chicken broom stick – non fat cream potato Boiled Pasta (non fat) – Light ayran
Refreshment	Non fat cheese + 2 pieces of grissini
Dinner	Soup (i.e. yoghurt soup) Grilled chicken breast Boiled potatoBoiled potatoes Light yoghurt
Refreshment	Freshly squeezed fruit juice

Diabetic Diet

The diabetic diet should be a low glycemic diet, and should have the ability to increase blood sugar slowly. It is important to cook the food with low fat content ingredients. Desserts and jams made with diabetic sugar can be preferred. Desserts made with sugar, pure sugar, honey, jam, fruit juice and unknown food are not served. It is possible for diabetic patients to weight more, brown breadt can be chosen as carbohydrate source. Rice should be avoided because it makes blood sugar increase fast. Instead, bulgur can be used. Only fruit itself will make blood sugar increase fast, so in addition to fruit, high proteined food like milk, yoghurt and, ayran are preferred. Moreover, potatoes, rice, white bread, melon, watermelon, fruit juice and dry fruits are foods with high glycemic index. They are not suitable for diabetic patients.

Cardiac Diet

In diets designed for heart care, fries and foods prepared by frying are not consumed. Steamed, roasted, grilled and boiled foods are preferred. Since sodium content of foods is hazardous to the heart, the foods should be prepared with using low amounts of salt. Pickled foods and highly salted foods are not served to the patients having cardiovascular diseases. As a protein source, chicken and fish meat is preferred. Red meat is given at least two days a week. For each meal, vegetable dishes and salad should be served. Dairy products are preferred when they have low fat content. Eggs should be given to patients 1-2 times a week.

Stomach Protection Diet

In stomach protection diet, the food should be neither too hot nor too cold. Spicy and fried foodstuffs are not preferred. In order to speed up the healing of the disease, it is important to consume protein as much as possible. Gassy products like yoghurt and ayran and as well as acidic fruits aren't preferred.

Constipation Diet

For the patients suffering from constipation problem, liquid consumption should be increased for patient nutrition. Pulp consumption is also important too, coldbrewed fruit can be added to the diet. Consumption of bananas, peach and potato cause constipation, so these foodstuffs should not be preferred in the diet. Dry fruits fasten the intestinal mobility due to their fiber content. At lunch and at dinner salad or fruits can be served.

Hypertension Diet

In this diet type, consumption of salt and salty products should be decreased. Thus, processed foods such as olive, pickles, salami, sausage, are not served to the patients as well as fat containg meals.

Cancer Diet

Patients who have advanced levels of cancer disease and who are faced with excessive amounts of weight lost and malnutrition need as spesific nutrition programme. Due to the growing tumor and as a result of the applied treatments, there is a lack of nutrition in the patients. In the cases of stomach and pancreas cancers, weight lost occurs very quickly. These are followed by lung, prostate and colon tumors. Nutritional support does not also increase the adaptation between treatment and patient, but also, increases positive effects of its treatment and, provides important relief for patients who are at metastatic level (Arrieta et al., 2010).

The evaluation of nutrition for a cancer patient starts with diagnosis. Eating habits of the patient are questioned and the changes on the pattern and its reasons are deeply evaluated. After this level, the body mass index and his/her weight should be noted, the changes on weight should be monitored and it should be looked into whether there is a loss in muscle and fat masses in the body.

Cachexia is connected to the response to the treatment and prognose. That is why pharmacological treatment and nutritional support should be provided for cachexia. The aim here is to provide efficient calorie intake and nutrition that is needed for protecting ideal weight to the patient.

Nutrition of Intensive Care Patients

Nutrition of intensive care patients is a very important factor affecting lifespan of the patient directly. The aim here is to avoid occurence of malnutrition. Malnutrition is the occurence of cell loss, disabilities between organs and body integrity caused by lack of food at macro and micro molecular levels.

The surviving chances of the patients who lose about 30% of their ideal body weights during intensive care are highly decreased.

A 70 kg patient having mid-light level catabolism lose 4 grams of nitrogen. To be able to keep normal nitrogen level, 100 gr of nitrogen should be taken into the body. 30-70% of the total calorie calculated for a day should include glucose. The dosage of this should be set to be lower than 225 mg/dL. 15-30% of daily calorie need should be obtained from fats and oils in the diet, remaining 15-20% daily needed calorie should be obtained from proteins and aminoacids (Kartal et al., 2004).

4. Discussion

The catering service in mass consuption places, is a process starting from obtaining the raw material to the service of the food and it always needs to be controlled. The establishment and application of HACCP system in this sector is vitally important for the assurance of food safety. The HACCP system could be flexible in these places as much as possible because of the wide variety of menus, food and preparation methods. Through an effective planning and monitoring systems, improvement of the quality and the assurance of safety in production and service of the foodstuffs can be gathered economically. Moreover, the improvement and development can be achieved by having an effective control system. ISO 22000 Food Safety Management System, when applied in food producing establishments correctly, decreases the problems and provides safe food production.

As for the in-patients, besides having treatment in hospital, their nutrition is also very important. Thus, nutrition process should be followed continuously and the nourishment support should be provided for the patients who are diagnosed with certain illnesses.

A nutrition program is prepared by taking the type of illness and calorie need of the patient into consideration. In the preparation of the diet programme the age, sex and weight of the patient are considered as importants parameters.

During the preparation of the meals for the in-patients, in the kitchen of the hospital, breakfast, lunch and dinner are served daily and these are prepared in accordance to the specified diet programmes of the patients. Safety rules in the kitchen are applied under the control of a food engineer. At research level, it was found out that the raw meals that are provided weekly are fresh products. Daily diet program is prepared by the dietitian with respect to patients' situations.

The needed raw materials and products are provided to the kitchen weekly by the assurence of food safety. Raw products are kept in storage rooms under suitable temperatures according to food groups. In the stogare rooms, "First comes, first goes" rule is a must and it is followed strictly. In the hospital, there are rooms for dry foods, a cold room and freezers. The food is held in one of these environments in terms of its characteristics and it is kept under control.

The products having shorter shelf-life, brought to the kitchen are prepared and consumed in a short time appropriately.

During the preparation of foodstuffs in the kitchen and serving the meals to patients, food safety rules are followed strictly. After pretreatments are applied in the kitchen, products are brought to the cooking process by following the hygienic rules depending on the type of the foodstuff. Cooked meals and raw meals are placed in different places and kept in seperate places for the service. After that, meals are heated with suitable heaters compliant with the rules of hygiene and served by the service personnel to the patiens.

It has been observed that kitchen personnel have participated in several training programmes i.e. seminars that are periodically organised by the hospital management. During these training programmes, the kitchen personnel were informed about food safety, hygiene applications, occupational health and safety, service rules and communication with patients. Also, in order to measure and improve the patients' satisfaction continuously, satisfaction questionnaires are applied monthly. The results are evaluated and necessary improvements are done.

In the kitchen of the hospital, the studies for the establishment of HACCP system has already been started and it is expected to be completed soon.

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