https://doi.org/10.5205/1981-8963.2019.238574

Journal of Nursing
UFPE On Line
ISSN: 1981-8963

ORIGINAL ARTICLE

EVALUATION OF REST-OF-INGESTION IN FOOD AND NUTRITION UNIT

AVALIAÇÃO DE RESTO-INGESTA EM UNIDADE DE ALIMENTAÇÃO E NUTRIÇÃO

EVALUACIÓN DE RESTO-INGESTA EN UNIDAD DE ALIMENTACIÓN Y NUTRICIÓN

Jéssica Sabrina da Silva[1], Joab Oliveira Salomão[2], Dayane da Silva Peres[3], Maria Olímpia Ribeiro do Vale Almada[4]

ABSTRACT

Objective: to evaluate the leftovers and rest-of-ingestion intake index of the Food and Nutrition Unit of the Oncology Patients Support Group. ***Method:*** this is a quantitative study in which the meals of 2664 diners were analyzed. For the analysis of the data, the tabulation was used to organize the information, and all calculations were performed according to formulas. ***Results:*** there was a surplus index of 24.4% and a rest index of 6.75 in patients and 8.29 in companions / collaborators, with the remainder index being above that recommended by the literature in which this study was supported, demonstrating a considerable loss of food. ***Conclusion:*** it is evaluated that the results of this work demonstrate that the IR index is in the acceptable index, according to the literature, however, the amount of food scorned by the FNU and the raw material expenditure are still excessive, with the waste of food and an unnecessary expense that could be reversed in other benefits for cancer patients. ***Descriptors*:** Rest-intake; food scraps; Acceptance and Waste; Planning; Food and Nutrition Unit; Oncology.

RESUMO

Objetivo*:** avaliar o índice de sobras e resto-ingesta do almoço da Unidade de Alimentação e Nutrição do Grupo de Apoio a Pacientes Oncológicos. ***Método*:** trata-se de um estudo quantitativo em que foram analisadas as refeições de 2664 comensais. Utilizou-se, para a análise dos dados, a tabulação para a organização das informações, e todos os cálculos foram realizados conforme fórmulas. ***Resultados*:** verificaram-se um índice de sobras de 24,4% e um índice de restos de 6,75 em pacientes e 8,29, em acompanhantes/colaboradores, sendo que o índice de sobras está acima do recomendado pela literatura em que este estudo se apoiou, demonstrando uma perda considerável de alimentos. ***Conclusão: avalia-se que os resultados deste trabalho demonstram que o índice de RI se encontra no índice aceitável, conforme a literatura, porém, a quantidade de alimentos desprezados pela UAN e a despesa com matéria-prima ainda são excessivas, ocorrendo o desperdício de alimentos e um gasto desnecessário que poderia ser revertido em outros benefícios para pacientes com câncer. ***Descritores*:** Resto-Ingesta; Índice de Sobras; Aceitação e Desperdício; Planejamento; Unidade de Alimentação e Nutrição; Oncologia.

RESUMEN

Objetivo: evaluar el índice de sobras y resto-ingesta del almuerzo de la Unidad de Alimentación y Nutrición del Grupo de Apoyo a Pacientes Oncológicos. ***Método:*** se trata de un estudio cuantitativo en el que se analizaron las comidas de 2664 comensales. Se utilizó, para el análisis de los datos, la tabulación para la organización de las informaciones, y todos los cálculos se realizaron según las fórmulas. ***Resultados:*** se verificó un índice de sobras de 24,4% y un índice de restos de 6,75 en pacientes y 8,29, en acompañantes / colaboradores, siendo que el índice de sobras está por encima del recomendado por la literatura en que éste estudio se apoyó, demostrando una pérdida considerable de alimentos. ***Conclusión:*** se evalúa que los resultados de este trabajo demuestran que el índice de RI se encuentra en el índice aceptable, conforme a la literatura, sin embargo, la cantidad de alimentos despreciados por la UAN y el gasto con materia prima todavía son excesivos, ocurriendo el desperdicio de alimentos y un gasto innecesario que podría revertir en otros beneficios para los pacientes con cáncer. ***Descriptores*:** Resto de la ìngestión; Índice de Sobras; Aceptación Y Despercicio; Planificación; Unidad de Alimentación y Nutrición; Oncología.

[1,2,3,4] University of the State of Minas Gerais / UEMG. Passos (MG), Brazil. ORCID: https://orcid.org/0000-0001-5025-7523 ORCID: https://orcid.org/0000-0002-7825-3935 ORCID: https://orcid.org/0000-0002-3908-2432 ORCID: https://orcid.org/0000-0002-6062-3387

How to cite this article
Silva JS da, Salomão JO, Peres DS, Almada MORV. Evaluation of rest-of-ingestion in food and nutrition unit. J Nurs UFPE on line. 2019;13:e238574 DOI: https://doi.org/10.5205/1981-8963.2019.238574

https://doi.org/10.5205/1981-8963.2019.238574

INTRODUCTION

It is known that the Food and Nutrition Units (FNUs) are units of the collective feeding sector, with the objective of preparing and providing nutritionally balanced meals, according to Sanitary Surveillance standards, according to the hygienic-sanitary standard. They are usually located in companies, schools, universities, hospitals, asylums, orphanages, among other institutions, performing activities related to food and nutrition, contributing to maintain or recover the health of collectivities and, also, assisting in the development of healthy eating habits.[1]

FNU is given the function of offering balanced and healthy meals, thus satisfying the diner with the offered service, which requires an appropriate physical environment with good hygiene conditions, providing the personal contact between the FNU employees and the clients and making the meal time enjoyable.[2]

It is understood that the quality of the food, as well as its presentation, can interfere in the amount of food eaten by the diners; In this way, FNUs can control the quality and quantity of food served through the control and management of the rest-of-ingestion (RI). In this context, it is evaluated that the units that work with the food for patients in cancer treatment require more attention, since the disease and the treatment interfere in the pattern of food consumption, and adequate food in quality and quantity is essential for the treatment support, demonstrating that it is of great importance to monitor the food intake and the factors related to the waste.

It was highlighted, in a study carried out at a FNU, where the researchers evaluated the opinion of the diners about the ambience of the cafeteria and the quality of the menu, among other results, that these factors, together, are determinant for the good performance of FNU and customer satisfaction. It was concluded that training with food handlers is necessary, since incorrect handling interferes directly with the hygiene and quality of meals, as well as the importance of the correct performance of a Nutrition professional qualified to work in a FNU.[3]

Thus, the participation of nutritionists in FNUs is of extreme importance and is associated with the quality of care and the final product: the meal. According to the Resolution of the Federal Council of Nutritionists (FCN) N. 380/2005, which establishes the definition of the areas of action of the nutritionist and their attributions, it is the responsibility of the nutritionist working at FNU to perform the assistance and nutritional education with the community or healthy or sick individuals in public and private institutions. It is also defined as supplementary activities of the nutritionist at FNU, to implant and supervise the periodic control of leftovers, rest-ingestion and waste analysis, promoting the social, ecological and environmental awareness of the commensals, as well as defining the nutritional needs customers, set standards, plan menus, and analyze tailings and leftovers.[3-4]

Leftovers are defined as all surpluses of industrialized, in natura, pre-prepared or ready-to-eat foods which were not used on the day of their preparation. They can be classified as clean and dirty or remainder: clean leftovers are ready-to-eat foods that have not been distributed, kept in the thermal counter or refrigerated under monitoring, and the leftover leftovers or rest are the ready-made foods that were served and should not be retained or those that were left on standby without time and temperature monitoring.[5-7]

There are multiple factors that influence the waste of food in a FNU, such as improper meal planning, employee training, portioning, or food preferences. It is pointed out that the waste of food in the food chain has ecological, economic, political, cultural and technological causes, which cover the main stages of the chain of movement: production, transportation, marketing, packaging and storage system.[8-10]

It is pointed out that waste is synonymous with lack of quality in a FNU, since the quantity of leftovers and debris is largely linked to the suitability and acceptance of the product offered to the customer, and this inadequacy can be avoided by appropriate planning, without excess of production and, consequently, leftovers.[11-2]

The ratio between the rest returned in the trays by the diner and the amount of food and food preparation offered, expressed as a percentage, of rest-ingestion (RI). Acceptable percentages of RI are allowed to rate less than 10% for healthy people and 20% for ill people, and values above these percentages suggest that the menus are not adequate.[13]

It is intended, for the control of RI, to evaluate the adequacy of the prepared quantities in relation to the consumption needs (leftovers), the portioning in the distribution and the acceptance of the menu through the foods returned by the customers.[14]

It was noticed in a FNU survey on RI that the remains and leftovers indexes were above the acceptable limit described in the literature, causing unnecessary costs to the establishment. It was concluded that it is necessary to adopt measures that can improve these indices, such as the reduction of waste, with adequate planning in the production process, the organization of campaigns directed to the diners and the training with the manipulators.[15]

It is suggested to implement measures to control food waste, such as the calculation of leftovers and RI after meals, associating the

https://doi.org/10.5205/1981-8963.2019.238574

application of waste control and its social and economic impact.[15]

In this sense, specific measures should be taken to avoid high amounts of leftovers and leftovers, since the high percentage of leftovers derives from factors related to the production of meals, including inadequate number planning of diners, the deficiency or lack of training of employees for the portioning, the error in the design of utensils and the lack of research on the eating habits of the diners. It is emphasized that, for example, a high content of remains in the trays may mean the non-acceptance of the menu by the commensal due to the type of preparation or the sensorial aspects of the same, to the lack of appetite of the diner, to emotional, psychosocial and economic factors the lack of awareness of the user about waste.[16]

It is known that losses can occur during the various actions to which the food is submitted during the process of production of meals, from its preparation to the final process, with leftovers and rest-ingestion, affecting the final result of the work. It is important to note that supervising, correcting possible deviations and keeping the actions under control are important aspects to be observed by the Nutrition professionals who work in this area of work.[17]

It is suggested that the evaluation of clean leftovers and leftovers indices is of great relevance to the increased costs of waste that could be more consciously utilized in the management of a food service, and it is through the IR rate that can investigate the real motives that interfere with the waste and, thus, carry out strategies to correct them, observing their causes. Therefore, this study is justified because it contributes to this analysis of the amount of waste generated and its reduction, so as to enable intervention strategies and increase the quality of the service provided, thus improving the acceptance of food oncological patient and contributing to a better nutritional support to the treatment.

OBJECTIVE

To evaluate the leftovers and rest-ingestion (RI) of the lunch of the Food and Nutrition Unit of the Cancer Support Group.

METHOD

This is a quantitative study, developed in the Support Group for Oncology Patients in the interior of Minas Gerais / MG. It is known that the group is a non-profit, non-governmental organization (NGO) that provides support and assistance to the cancer patient, regarding their reception and the provision of services related to needs such as food, rest, occupation of the vacant time, among others, sustained almost essentially by voluntary work. Data collection was performed between the 1st and 29th of July 2018, from Monday to Friday, totaling 21 days. The measurements of the weighings were carried out in the morning, at lunch, totalizing 2664 diners.

Leftovers and RI of the lunch of all the diners were evaluated (collaborators, companions and patients of the service) of the FNU of the Support Group for Oncological Patients of Passos (MG).

The data on the weight of the prepared, clean and left over and rest-ingestion preparations were checked using a digital scale, Filizola® brand, with a capacity of 130 kg, with inspection and sealing of the National Institute of Metrology, Standardization and Industrial Quality (INMETRO), discounting the container weights.

The portion of the produced preparations that were packaged in appropriate containers and stored at a suitable temperature for the later use, and discarded, was considered to be clean leftover the unserved preparations that have been placed in the dispensing counter until the end of the meal.

The weight of the RI was obtained by weighing the waste basket, located in the tray return area, which contained the foods scorned by the diners, discounting the weight of the basket. It should be noted that the remnants of cancer patients and other commensals were separated into different baskets. Parts of inedible foods, such as bark, seeds and bones, have been excluded. Employees were advised to use their own trash can to dispose of the rest, not allowing the disposal of anything other than leftovers from the trays and dishes of the diners.

In order to perform the analysis and analysis of the data collected, the tabulation was used to organize the information, and all calculations were performed according to formulas.[11]

For the calculation of the distributed meal portion (g), the formula:

https://doi.org/10.5205/1981-8963.2019.238574

Distributed meal weight (kg) = total produced - leftovers ready after serving meals

Per capita consumption per meal was calculated by formula:

Per capita consumption per meal (kg) = distributed meal weight / number of meals

The excess percentage was calculated by formula:

% of leftovers = leftovers ready after serving meals x 100 / weight of the meal distributed

The average amount of leftover per customer was calculated using formula:

Leftover weight per customer (kg) = leftover weight / number of meals served

The rest-ingestion index was calculated by formula:

% of rest-of-ingestion = weight of rest x 100 / weight of the meal distributed

Utilizou-se, para se obter o resto-ingestão *per capita*, a equação:

***Per capita rest-of-ingestion*(kg)** = weight of rest / number of meals served

It was considered, in order to calculate the waste, the number of people that could be fed with the surplus and the rest accumulated during the period of data collection through the equations:

People fed on the accumulated surplus = accumulated surplus / consumption per capita per meal.
People fed with the accumulated rest = accumulated rest / consumption per capita per meal.

The studied FNU was evaluated after the calculation of the variables mentioned above. Data is presented, according to the principles that involve the quantitative approach, through graphs, figures and tables. The data collected and the theory contemplated in this study were correlated in this step, in accordance with the research objectives.

RESULTS

In July 2018, 2664 meals for patients, companions/collaborators in the studied FNU were used, as described in table 1.

Table 1. Distribution of meals served at the GAPOP FNU regarding the number of patients, companions / collaborators and weight of the prepared meal. Passos (MG), Brazil, 2018.

Day	N of meals served to patients	N of Meals served to companion/ collaborator.	Total of diners	Meal Weight Ready (kg)
01	53	57	110	98.306
04	90	74	164	141.900
05	71	66	137	128.700
06	71	71	142	139.500
07	75	66	141	129.400
08	63	62	125	94.300
11	72	72	135	105.130
12	69	70	132	110.995
13	76	79	145	101.300
14	60	61	115	98.215
15	55	54	109	96.850
18	57	73	130	103.900
19	62	56	118	98.306
20	77	72	149	119.726
21	73	66	139	112.200
22	45	55	100	87.900
25	59	48	107	91.200
26	45	50	95	92.430
27	62	66	138	98.657

28	66	70	136	96.830
29	43	54	97	94.125
Total	1344	1342	2664	2239.87
Média	64	63.90476	126.8571	106.6605

From the results of this study, the mean meal weight served to the diners was 676.81 grams, and the surplus index was 24.4%, with an average amount of surplus per customer of 0.164 grams (figure 1), which is higher than recommended by the literature.

Figure 1. Distribution of meals served at the GAPOP FNU regarding the number of patients, companions / collaborators and weight of the prepared meal. Passos (MG), Brazil, 2018.

Day	Patient Rests (kg)	Rests Comp./ Colabor. (kg)	Bench Leftover Weight (kg)	Weight clean leftovers (kg)	Total leftovers (kg)	Grams per diners (grams)	Leftovers by customer (grams)	Meals distributed (kg)	% of leftovers
01	3.470	5.700	3.350	10.35	14.700	758.63	0.133	83.606	17.58
04	3.275	5.170	8.200	17.20	25.400	710.36	0.104	116.5	14.7
05	3.800	4.400	6.000	23.22	29.220	726.13	0.21	99.480	29.37
06	2.100	3.200	16.000	7.732	23.332	818.08	0.164	116.168	20.08
07	1.800	2.600	10.200	17.069	27.890	719.92	0.197	101.51	27.475
08	1.300	1.400	9.000	12.200	21.200	584.80	0.169	73.1	29.00
11	2.800	4.400	6.400	14.400	20.800	624.66	0.154	84.33	24.66
12	2.100	3.800	10.500	10.400	20.900	682.53	0.158	90.095	23.19
13	1.800	2.700	4.100	6.600	10.700	624.82	0.073	90.6	11.81
14	1.700	2.000	0.000	14.400	14.400	728.82	0.125	83.815	17.18
15	1.500	1.400	7.700	19.200	26.900	641.74	0.246	69.95	38.45
18	2.100	2.200	9.500	5.200	14.700	686.15	0.113	89.2	16.479
19	1.900	2.300	4.400	18.300	22.700	640.72	0.192	75.606	30.02
20	2.250	2.380	13.200	14.600	27.800	616.95	0.186	91.926	30.24
21	3.200	2.500	11.900	16.700	28.600	601.43	0.205	83.6	34.21
22	2.200	3.100	5.500	14.300	19.800	651.00	0.198	68.1	29.07
25	4.200	6.400	5.200	10.950	16.150	701.40	0.150	75.05	21.51
26	3.900	5.600	0.800	21.000	21.800	743.47	0.229	70.63	30.08
27	4.350	3.900	3.035	10.88	14.235	611.75	0.103	84.42	16.86
28	3.200	4.050	4.200	14.200	18.400	576.69	0.135	78.43	23.46
29	5.350	4.875	5.350	14.75	20.100	763.14	0.207	74.02	27.15
Total	58.295	74.075	144.535	293.651	439.727	14213.19	3.451	1800.136	512.574
Average	2.776	3.527381	6.882619	13.98338	20.93938	676.8186	0.164333	85.72076	24.40829

It is recorded that, in relation to the remains, the average for patients per day was 2,776 kg and 3,527 kg for companions and collaborators, respectively (Table 2).

Table 2. Distribution of meals served at the GAPOP FNU regarding the number of meals served to patients, companions / collaborators and patient / companion / collaborator remains. Passos (MG), Brazil, 2018.

Day	N of meals served to patients	N of Meals served to comp./ colabor.	Total of diners	Patient Remains (kg)	Rests Comp./ Colabor. (kg)
01	53	57	110	3.470	5.700
04	90	74	164	3.275	5.170
05	71	66	137	3.800	4.400
06	71	71	142	2.100	3.200
07	75	66	141	1.800	2.600
08	63	62	125	1.300	1.400
11	72	72	135	2.800	4.400
12	69	70	132	2.100	3.800
13	76	79	145	1.800	2.700
14	60	61	115	1.700	2.000
15	55	54	109	1.500	1.400
18	57	73	130	2.100	2.200
19	62	56	118	1.900	2.300
20	77	72	149	2.250	2.380
21	73	66	139	3.200	2.500
22	45	55	100	2.200	3.100
25	59	48	107	4.200	6.400
26	45	50	95	3.900	5.600
27	62	66	138	4.350	3.900
28	66	70	136	3.200	4.050
29	43	54	97	5.350	4.875
Total	1344	1342	2664	58.295	74.075
Average	64	63.904	126.857	2.776	3.527

https://doi.org/10.5205/1981-8963.2019.238574

It was verified that the mean RI index was 6.75 in patients and 8.29 among companions / collaborators.

Figure 2. Distribution of meals served at GAPOP FNU according to weight, rest per capita and percentage of remains between patients and companions / collaborators. Passos (MG), 2018.

Day	Meals distributed (kg)	Distributed meal - patients (kg)	Meal distributed / companions (kg)	Rests per capita Patients (g)	Rests per capita Comp./ Colabor. (g)	% rests patients	%rest Comp./ Colabor.
01	83.606	40.282	43.324	0.065	0.100	8.61	10.84
04	116.5	63.932	52.567	0.036	0.069	5.12	9.83
05	99.480	51.55	47.924	0.053	0.066	7.37	9.18
06	116.168	58.083	58.083	0.029	0.045	3.61	5.50
07	101.51	53.994	47.51	0.024	0.039	3.33	5.47
08	73.1	36.842	36.25	0.020	0.022	3.52	3.86
11	84.33	42.165	42.165	0.038	0.061	6.64	10.435
12	90.095	47.095	42.999	0.030	0.054	4.45	8.83
13	90.6	47.486	43.113	0.023	0.034	3.79	6.25
14	83.815	43.729	40.985	0.028	0.032	3.88	4.87
15	69.95	35.295	34.654	0.027	0.025	4.24	4.03
18	89.2	39.110	50.089	0.036	0.030	5.36	4.39
19	75.606	39.725	35.880	0.030	0.041	4.78	6.41
20	91.926	47.505	44.420	0.029	0.033	4.73	5.35
21	83.6	43.905	39.694	0.043	0.037	7.28	6.29
22	68.1	30.645	37.455	0.048	0.056	7.17	8.33
25	75.05	41.382	33.668	0.071	0.133	10.14	19.00
26	70.63	33.456	37.173	0.086	0.112	11.65	15.06
27	84.42	37.927	46.493	0.070	0.059	11.46	8.38
28	78.43	38.061	40.368	0.048	0.057	8.40	10.03
29	74.02	32.812	41.207	0.12	0.09	16.3	11.8
Total	1800.136	904.981	896.021	0.954	1.195	141.83	174.13
Average	85.720	43.094	42.667	0.045	0.056	6.75	8.29

It was evidenced in this study that about 846 people could be fed with accumulated remains and leftovers in the 21 days of data collection at the site, with a per capita consumption of 0.676 kg (Table 3).

Table 3. Distribution of people who could be fed with the rest and leftover accumulated during the 21 days of data collection in the GAPOP. Passos (MG), Brazil, 2018.

Leftovers (kg)	Rests (kg)	Rejected food (kg)	Amt consumed (kg)	Meals	Consumption *per capita* (grams)	People fed
439.727	132.37	572.097	1.667.766	2664	0.676	846.296

DISCUSSION

In the month of July 2018, 2664 meals were served in the studied FNU.

In terms of the number of meals a day, a balance was observed in the number of people served on the premises, since 1344 (50.45%) were intended for patients and 1342 (49.55%), companions and / or employees, which corresponds to an estimated average of about 127 meals / day, in addition to an average weight of all prepared meals of 107 kg / day.

It is understood that food consumption in patients with cancer is of extreme importance, since, as a catabolic disease, the tumor, when malignant, consumes the nutritional reserves of the host, leading to nutritional damage. Thus, nutritional intervention for the clinical improvement of the patient and the control of the symptomatology developed by the treatment, which can influence the weight gain and cause many adverse effects, such as organic toxicities. It is verified that the gastrointestinal toxicities occur frequently and are most related to the nutritional questions of the patients, interfering in the adequate feeding of the individual and leading to the nutritional deficit.[17]

It is described that the cancer patient may present, during treatment, symptoms such as inappetence, dysgeusia, oral candidiasis, mucositis, nausea and intestinal constipation, which consequently leads to reduced appetite. It is observed that, in this context, nutritional intervention, together with the assistance of the multiprofessional team, can contribute to the improvement of the nutritional status and quality of life of this patient, since the obtaining of strategies to favor the feeding can have results in the clinical and social context, improving their life

https://doi.org/10.5205/1981-8963.2019.238574

condition, and contributing to the reduction of waste in FNUs.[18]

It is considered urgent, given the clinical and emotional context of cancer patients and their families, to discuss the results that refer to food wastage in order to subsidize improvements in nutritional and food assistance for this public.

The average weight of the meal served to the diners was 676.81 grams, and the surplus index was 24.4%, with an average amount of leftovers per customer of 0.164 grams, which is higher than recommended in the literature in which this study was supported. Acceptable percentages of up to 3% or seven to 25 grams of leftovers per person are acceptable, demonstrating a large loss of food. In studies conducted values were much lower (2% to 3%), which reveals the commitment of FNUs in the constant reduction of food waste.[9]

In studies, periodic evaluation of leftovers provides an indication of the efficiency of planning in terms of the number of meals to be prepared, the per capita sizing, the conformation of the utensils used to serve, the compatibility of the preparations with the their food habits and the efficiency of food production, which covers the presentation of the preparations. It is observed that the daily weighing of food in FNUs is an effective measure in the reduction of the leftovers, being of easy control, as a way to identify the excess production and the customer's dissatisfaction.[19-20]

In relation to the remains, the values found in this study were higher than those found in some studies in which averages of 2.110 and 2.576 kg of rest / day were calculated respectively.[21-2]

The results of this study can be related to the preparation of the same dish very often, to the appearance and / or improper presentation of the food, to the use of utensils inappropriate to serve, as well as to the failure in the planning as to the number of meals to be served, similar to the findings of other studies.[22]

The RI index observed is within the established limit, according to other authors who found rates lower than 10% for healthy people and 20% for patients; despite this, better planning of meal production and implementation of measures to reduce waste and optimize costs are still needed. In another study, the decrease in RI after the nutritional intervention was observed, from 49.3 grams per capita to 39 grams per capita, with results similar to those of another study in which, after nutritional intervention, of 33.3 grams RI (reduction of 12.4 g).[12-3,23]

The remainder, considered as one of the forms of waste, is defined as the amount of food returned in the dish or tray by the customer, and this should be evaluated not only from an economic point of view, but also, taking into account the absence of interaction with the customer. It is pointed out that the work of nutritional education with the diners must be carried out continuously by the nutritionist, aiming at the control of food waste and the satisfaction of the customers' expectations through the adequacy of the offered menus.[24]

In this study, a high level of waste was observed where approximately 846 people could be fed with the remains and accumulated leftovers during the collection of data, corroborating another study that also found great waste, in which the total clean leftovers and RI of the one-week period was sufficient to feed 452 people. It was identified in a study in an outsourced FNU of the northwest of the State of Rio Grande do Sul that about 420 kg of food were placed in the trash per day by the diners, which refers to the fact that the diners may not be satisfied with the meal offered or end up serving too much.[25-6]

In a study carried out in 2015, a rate of RI between the companions was variable, monthly, between 2.60% and 3.18%, before the implementation of an awareness campaign and, subsequently, with an improvement in the results, which were between 1.04% and 1.65%. In an earlier study with chaperones and servants of a hospital in the interior of Bahia, recurrent repetitions of main dishes of this public were observed, which may reflect the acceptance of food and, therefore, the increase of the waste.[13,27]

It is worth noting that statistical data show a per person per person food wastage of 150 grams per day, corresponding to a total of 55 kg of food wasted per year, which would feed thousands of hungry people around the world.[27]

It is observed that, when related to FNUs, waste is synonymous with lack of quality, it should be avoided by means of adequate planning and denotes the lack of awareness and commitment of the patients / companions / employees with the reduction of waste, besides factors that may have interference in the food waste, such as the temperature of the food served, the quality of the preparation, the level of appetite of the client, since cancer patients can often present with symptoms such as nausea and vomiting due to chemotherapy treatment, inappropriate serving utensils and / or large dishes that lead clients in many cases, to serve with excessive quantities, as well as the lack of option of smaller portions, among others.[14]

It is shown by the Food and Agriculture Organization report that 54% of the world's food waste occurs early in production, which involves post-harvest handling and storage. It is noted that the remaining 46% come from the processing, distribution and consumption stages, which include FNUs.[28]

In this perspective, we must treat waste as a constant theme to be worked on in the daily life of a FNU, from the pre-preparation, to the cooking and distribution of food, which refers the manager to the search for the interest and commitment of the employees and clients, with a view to alleviating such problem, through training, educational campaigns, awards, among others.[28]

It is noteworthy that the implementation of measures to reduce waste reflected in the improvement in the RI index, which shows that the sensitization by the diners, after the disclosure of a material that emphasized the importance of waste control and its social impact and economic, was essential in this sense.[28]

It is suggested that FNUs should prioritize the provision of healthy meals with a hygienic-sanitary standard in order to meet the needs of their clientele, especially when related to the provision of meals to cancer patients. Note the relevance of the nutritionist's performance in these services, since he is able to maintain a satisfactory alimentary consumption, even in the face of the gastrointestinal symptoms commonly found during the chemotherapeutic treatment, besides the better planning of the meals to be prepared. It is recommended, in relation to the adverse effects of cancer treatment, by the National Consensus on Oncological Nutrition, that the patient should be encouraged to feed, despite the toxicities felt, which can lead to adequate food and improve their relationship with food. Therefore, nutritional care is an important factor for prognosis, since it reduces nutritional damage and improves the response to treatment and the relationship with symptoms, increasing the quality of life of the patient.[28]

In relation to the role of the nutritionist in the planning of meals as a way to reduce the waste in the studied FNU, the data of this research corroborate the data of another study in which the absence of planning was identified, especially in relation to to the fact that the calculated per capita is a primary factor for increased wastage, which shows the importance of the nutritionist insertion in FNUs for cancer patients.[28]

Therefore, in order to help reduce the waste in the studied FNU, it was established, therefore, before the results of this study and before the analysis of the literature on the subject, 29 to carry out educational campaigns aimed at the patients, companions and collaborators for the control of their leftovers; to sensitize all those who are part of the process through the dissemination of informative materials that emphasize the importance of waste control and its social and economic impact; count on the collaboration of a local nutritionist, in order to allow adequate meal planning; produce foods in smaller portions that allow the client to serve again when desired, instead of putting more than the desired on the plate, since, as previously stated, oncology patients undergoing treatment have gastrointestinal disorders that can reduce the appetite; use serving utensils and dishes of appropriate size; to train and make the team aware of how to prepare food gradually, whenever possible, with a view to a good presentation of food throughout the distribution period; raise awareness and involve the entire team in order to establish possible goals to be achieved with regard to control to spare; constantly monitor activities in order to obtain a standardization of processes and services.

CONCLUSION

It is concluded that, although the IR index is within acceptable levels, according to the literature, the amount of food scorned by FNU and raw material expenditure is still excessive, leading to food waste that could feed other people, plus an unnecessary expense that could be reversed in other benefits for cancer patients and companions looking for the location.

It is possible, with this work, to support the implementation of waste reduction and food optimization measures at FNU, the orientation and awareness of those involved in order to reduce the daily rate of RI, and the accomplishment of adequate planning by the team of service.

REFERENCES

1. Colares LGT, Freitas CM. Work process and workers' health in a food and nutrition unit: prescribed versus actual work. Cad Saúde Pública. 2007 Dec; 23(12):3011-20. Doi: http://dx.doi.org/10.1590/S0102-311X2007001200022

2. Bessa AP, Araújo MBV. Analysis of customer satisfaction of nutritional services of a food and nutrition Uberaba-MG. Cad pós-grad FAZU Uberaba [Internet]. 2011 [cited 2018 Aug 10]. Available from: http://www.fazu.br/ojs/index.php/posfazu/article/viewFile/400/292

3. Fonseca KZ, Santana GR. Guia prático para gerenciamento de unidades de alimentação e nutrição [Internet]. Cruz das Almas: UFRB; 2012 [cited 2019 June 15]. Available from: https://www1.ufrb.edu.br/editora/component/phocadownload/category/2-e-books?download=32:guia-pratico-para-gerenciamento-de-unidades-de-alimentacao-e-nutricao

4. Faria CP, Kopper AM, Lima MG. Avaliação da aplicação dos conceitos de sobras sujas e limpas em uma empresa fornecedora de refeições coletivas. Rev Hig Alim. 2009;23:170-

5. Welfer C, Pereira SL. Análise de desperdício em uma Unidade de Alimentação e Nutrição

(UANs) industrial na cidade de Quedas do Iguaçú. Rev Científica da Faminas - V. 11, N. 1, JAN.-ABR. 2015 Disponível em: http://www.fag.edu.br/graduacao/nutricao/resumos2007/Cristiane%20welfer.pdf

6. Zandonadi HS, Maurício AA. Evaluation of rest-ingestion of meals consumed by construction workers in the city of Cuiabá, MT. Rev Hig Alim [Internet]. 2012 Mar/Apr [cited 2018 Dec 15];26(206/207):64-70 [cited 2018 Aug 10]. Available from: http://bases.bireme.br/cgi-bin/wxislind.exe/iah/online/?IsisScript=iah/iah.xis&src=google&base=LILACS&lang=p&nextAction=lnk&exprSearch=661549&indexSearch=ID

7. Castro MHCA. Fatores determinantes de desperdício de alimentos no Brasil: diagnóstico da situação [dissertation]. Fortaleza: Universidade Estadual do Ceará; 2002.

8. Silva A, Silva CP, Pessina EL. Avaliação do índice de resto ingesta após campanha de conscientização dos clientes contra o desperdício de alimentos em um serviço de alimentação hospitalar. Rev Simbio-Logias [Internet]. 2010 June [cited 2018 Dec 15];3(4):43-56. Available from: http://www.ibb.unesp.br/Home/Departamentos/Educacao/Simbio-Logias/Avaliacao_indice_de_resto_ingesta_apos_campanha_conscienti.pdf

9. Paiva DCS, Nascimento JC, Cabral BEM, Félix ACF, Lopes MS, Estevam E. The rest-intake index rating in a food and nutrition unit of an oncology hospital after the alteration in the distribution system and leftover control. Rev Científica FAMINAS [Internet]. 2015 [cited 2018 Dec 15];11(1):45-54.

10. Heikkilä L, Reinikainen A, Katajajuuri JM, Silvennoinen K, Hartikainen H. Elements affecting food waste in the food service sector. Waste manag. 2016 Oct;56:446-53. Doi: https://doi.org/10.1016/j.wasman.2016.06.019

11. Vaz CS. Restaurantes: controlando custos e aumento lucros. Brasília: LGE;2006.

12. Ricarte MPR, Fé MABM, Santos IHVS, Lopes AKM. Avaliação do desperdício de alimentos em uma Unidade de Alimentação e Nutrição Institucional em Fortaleza-CE. Saber Científico [Internet]. 2008 Jan/June [cited 2018 Aug 10];1(1):158-75. Available from: http://revista.saolucas.edu.br/index.php/resc/article/download/10/ED110

13. Moura RL, Rodrigues SS, Araújo EMS, Nascimento FRL, Rodrigues Neto, Stopelle KRS. Avaliação do índice de resto ingestão e sobras em unidade de alimentação e nutrição localizada no campus Picos do Instituto Federal do Piauí. In: VII Congresso Norte Nordeste de Pesquisa e Inovação. Anais de VII Congresso Norte Nordeste de Pesquisa e Inovação. 2012. Palmas: IFTO; 2012 [cited 2018 Dec 15]. Available from: http://propi.ifto.edu.br/ocs/index.php/connepi/vii/paper/viewFile/203/1759

14. Leite D. Avaliação do índice de resto-ingestão e sobras em uma Unidade de Alimentação e Nutrição (UAN). Rev Nutrir [Internet]. 2015 Jan/June [cited 2018 Aug 09];1(4):72-7. Available from: http://www.faculdadespontagrossa.com.br/revistas/index.php/nutrir/article/view/136

15. Amaral LB. Redução de Desperdício de alimentos na produção de refeições hospitalares [monography] [Internet]. Porto Alegre: Faculdade IBGEN;2008 [cited 2018 Nov 15]. Available from: http://lproweb.procempa.com.br/pmpa/prefpoa/sma/usu_doc/luciane_busato_do_amaral._tcc.pdf

16. Morais SR, Bezerra AN, Carvalho NS, Viana ACC. Nutrition, quality of life and palliative care: integrative review. Rev Dor. 2016 June;17(2):136-40. Doi: http://dx.doi.org/10.5935/1806-0013.20160031

17. Spinelli MGN, Cale LR. Avaliação de resíduos sólidos em uma Unidade de Alimentação e Nutrição. Rev Simbio-Logias [Internet]. May 2009 [cited 2018 Nov 15];2(1):21-30. Available from: http://www.ibb.unesp.br/Home/Departamentos/Educacao/Simbio-Logias/Avaliacao_Residuos_Solidos_Unidade_Alimentacao.pdf

18. Schmidt V. Análise do índice de resto-ingesta em uma Unidade de Alimentação e Nutrição do município de Ijuí –RS [dissertation][Internet]. Ituí: UNIJUÍ; 2014 [cited 2018 Sept 10]. Available from: http://bibliodigital.unijui.edu.br:8080/xmlui/bitstream/handle/123456789/2582/TCC%20VANESSA%20SCHMIDT%20VERS%C3%83O%20FINAL%20PARA%20BANCA.pdf?sequence=1

19. Borges KM. Avaliação do planejamento de refeições de uma UAN hospitalar privada em Porto Alegre/RS. 2015 [dissertation][Internet]. Porto Alegre: Universidade Federal do Rio Grande do Sul; 2015 [cited 2018 Apr 29]. Available from: https://lume.ufrgs.br/handle/10183/127116

20. Cabral DD, Rodrigues DN, Brum JP. Avaliação do índice de resto ingesta e excedente de produção de alimentos em um serviço de alimentação hospitalar após campanha contra desperdício. In: IV Salão de Ensino e de Extensão UNISC. Anais do IV Salão de Ensino e de Extensão UNISC. 2013 [Internet]. Santa Cruz do Sul: UNISC; 2013 [cited 2018 Dec 21]. Available from: http://online.unisc.br/acadnet/anais/index.php/salao_ensino_extensao/article/view/10972

21. Guizzoa FM, Ballardina AC, Borgesa C, Souza LT, Cecchinb M, Pereira FB. Resto-ingesta de uma unidade de alimentação e nutrição (UAN) da cidade de São Marcos-RS. In: III Congresso de Pesquisa e Extensão da FSG. Anais do III Congresso de Pesquisa e Extensão da FSG. 2015 [Internet]. Caxias do Sul: FSG;2015 [cited 2018 Nov 25]. Available from:

http://ojs.fsg.br/index.php/pesquisaextensao/article/view/1713

22. Silva APS, Santos MA, Spinelli MGN, Matias ACG, Coelho HDS. Intervenção educativa no controle de restos em Unidade de Alimentação e Nutrição. Rev Universidade Vale do Rio Verde. 2016 Aug/Dec;14(2):319-27. Doi: http://dx.doi.org/10.5892/ruvrd.v14i2.2660

23. Ferreira JA, Santos CHP, Pereira AJS, Britto MB, Santos DR, Britts LT. Avaliação da sobra limpa e resto ingesta de um CEINF em Campo Grande-MS. Ensaios e Ciência: C Biol Agrárias Saúde [Internet]. 2012 [cited 2018 Sept 06];16(1):83-4. Available from: http://www.pgsskroton.com.br/seer/index.php/ensaioeciencia/article/download/2819/2673

24. Ianiski VB, Ianiski LB, Vieira EL. Análise do índice de resto - ingesta em uma Unidade de Alimentação e Nutrição. In: XXIII Seminário De Iniciação Científica Unijuí, XX Jornada de Pesquisa, XVI Jornada de Extensão, V Mostra de Iniciação Científica Júnior, V Seminário de Inovação e Tecnologia. Anais do XXIII Seminário De Iniciação Científica Unijuí, XX Jornada de Pesquisa, XVI Jornada de Extensão, V Mostra de Iniciação Científica Júnior, V Seminário de Inovação e Tecnologia, 2015 [Internet]. Ijuí: Unijuí; 2015 [cited 2018 Dec 15]. Available from: https://www.publicacoeseventos.unijui.edu.br/index.php/salaoconhecimento/article/view/5058/4240.

25. Brito LF, Bezerra VM. Avaliação qualitativa do cardápio. Alim Nutr Braz J Food Nutr [Internet]. 2013 Apr/June [cited 2018 Aug 10];24(2):153-8. Available from: http://serv-bib.fcfar.unesp.br/seer/index.php/alimentos/article/view/153/2419

26. Anjos ACS, Tavares HC, Bulhões CDBB, Mori E. Avaliação do índice de resto-ingestão em uma unidade de alimentação e nutrição. Rev. e-ciência, 2017. 5(2):116-120.

27. Food And Agriculture Organization. Food wastage footprint: impacts on natural resources [Internet]. Rome: FAO; 2013 [cited 2019 Jan 15]. Available from: http://www.fao.org/3/i3347e/i3347e.pdf

28. Carmo SO, Lima TP. Avaliação do índice de sobras limpas em uma Unidade de Alimentação e Nutrição (UAN) institucional na cidade de Campo Grande-MS. Ensaios e Ciência: C Biol Agrárias Saúde. 2011;15(6):9-20. Doi: http://dx.doi.org/10.17921/1415-6938.2011v15n6p%25p

29. Vinck K, Scheelen L, Du Bois E. Design opportunities for organic waste recycling in urban restaurants. Waste Manag Res. 2019 Jan;37(1 Suppl):40-50. Doi: 10.1177/0734242X18817714

Submission: 2018/11/07
Accepted: 2019/06/16
Publishing: 2019/07/19

Corresponding Address

Maria Olímpia Ribeiro do Vale Almada
E-mail: maria.almada@uemg.br