Original article

Nutritional Quality and Feasibility of Meals Provided by a Canteen for the Poor: The 60-Year Experience of the "Opera Di San Francesco" in Milan, Italy

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Abstract. *Background and aim:* The rapid increase in the number of vulnerable people who depends on meals provided by the canteens for the poor all over the world suggests the importance to provide menus that are as much as possible adequate to cover nutritional need also paying attention to the feasibility of the intervention. Objectives: to present a dining experience for the poor and/or homeless in Milan by analyzing: 1) the general characteristics of the canteen users 2) the nutritional composition of the meals with the aim of highlighting possible nutritional deficiencies 3) the feasibility aspects associated to the menu development and management Setting: Canteen for the poor "Opera di San Francesco" Milan, Italy *Methods:* A qualitative and quantitative analysis of the cost, type of foods and nutrients composition of the overall meals provided (736.352) was made and data compared with the reference values for the adult Italian population (LARN 2014). The canteen distributes about 2,336 meals a day, 6 days a week from Monday to Saturday. The menus analysed were those of the winter (7 months, from 01/01 to 30/4 and from 01/10 to 31/12) and summer (5 months, from 1/5 to 30/09) seasons. The total number of meals in the period 2017-2020 was also considered. *Results:* On average, the winter menu provided 2039 Kcal as a mean (15% proteins, 29% lipids, 56% carbohydrates) while the summer menu provided 2146 Kcal (15% proteins, 28% lipids, 57% carbohydrates). The total number of meals provided remained constant in the period 2017–2020 despite the sanitary situation. *Discussion:* Overall, energy intake and macronutrients composition of both the summer and the winter menus were in line with recommendations. However, calcium, vitamin D, folate, vitamin B2, B6, B12 and zinc requirements were not satisfied due to the scarcity of foods such as milk and dairy products but also fish and vegetables while the salt content was high with respect to recommendations. Despite the overall good nutrient composition of the meals and affordability, the data obtained underline some critical nutritional aspects that could be improved by revising the selection of foods provided by the meals.

Key words: canteen for the poor, menu, nutrition, homeless people, feasibility

Introduction

In Europe and in the so-called "civilized" countries, many people are looking for work and social-economic stability. The number of poor people is constantly growing, and public and voluntary communities are facing complex problems to find effective answers to basic needs such as food and shelter. This is due to the lack of public assistance programs, increasingly restrictive food allocation, and housing criteria at appropriate prices (1).

In many studies conducted to assess the food and nutrient requirements of the poor, the scarcity and poverty of pertinent data is evident (2–7).

A recent British study (8) has shown that the prevalence of homeless people is increasing and the demand for food aid through charitable services has increased. Nutritional improvements are also being studied to make charitable meals more nutritionally balanced (8, 9).

An interesting German study has highlighted that the prevention of nutritional problems in the adult homeless population in Germany is directly related to a whole series of health problems. Specifically, it was reported underweight and malnutrition (29%), obesity (22.7%) and chronic diseases in two thirds of the population studied (33.3%); in addition, gastrointestinal disorders (32%), dental diseases (22.7%), psychotic disorders (18.7%), dependency habits such as smoking (82%), alcohol (51%), and drug abuse (20%). (10)

A study on young homeless people in Toronto (Canada) also highlighted the scarcity of energy and nutrient intake in both sexes (11). A study of charity meals offered to homeless adults highlighted the nutritional inadequacy of these meals and the need for improvement that requires new resources (1). This consideration become even more significant in at risk pandemic conditions due to both potential uncertainties in the capacity to promote an adequate meal service and the possibility of an increase demand of meals associated to an increase of vulnerable target population (e.g. with new economic problems).

The Opera di San Francesco (OSF) in Milan is a non-profit association that for over 60 years has been ensuring primary and free welcome to people in need of food, clothing, personal hygiene and medical care to restore dignity and hope through sharing and solidarity. Several other humanitarian organizations in Italy ensure primary and free reception for people in need of food, clothing, personal hygiene and medical care. In 2017, OSF distributed in Milan a total of 736,352 meals, allowed 38,932 admissions to showers, gave 9,772 changes of clothes, 34,440 outpatient medical services, and distributed 59,993 packages of drugs received by a total of 26,487 people.

The purpose of the work was to evaluate specifically:

a. the adequacy of the meals prepared in the canteen for the poor by comparing their composition with the Italian nutritional reference intake;
b. the feasibility of the approach enabling the maintenance of the food assistance for the poor.

Materials and Methods

Setting and evaluation of meals provided and nutrient composition

The evaluation have been performed considering data collected in the year 2017 regarding the number and type of users, number and characteristics of the meals and costs of the service provided by the Opera di San Francesco of Milan (OSF).

In addition, data on total meals provided (and their characteristics) in the subsequent 3 years have been also considered (2017–2020).

The menus have been also analysed to calculate average daily and weekly quantities of foods; in addition the weekly food frequencies were evaluated.

Nutrient composition evaluation was performed both on the winter menu and on the summer menu by using a specifically developed software (13). Data obtained were compared with the Italian reference values in order to verify adequacy of the meals with respect to the nutritional recommendations (LARN 2014).

Results and Discussion

Table 1 show the number of meals provided in the period 2017–2020.

Overall, from 2018 onwards, the number of users has decreased due to state policies that regulate migration flows. The COVID-19 pandemic that started in 2020 did not significantly affect the number of users and meals distributed, even if a trend towards a reduction was evidenced due to a strong decrease in the

Table 1. Number of meals years 2017-2020

	Year 2017	Year 2018	Year 2019	Year 2020
Total distributed meals	736352	712268	691528	643069
Number of meals/day	2336	2261	2195	2041

Note: From 2018 onwards, the number of users has decreased due to state policies that regulate migration flows. The COVID-19 pandemic that started in 2020 did not significantly affect the number of users and meals distributed

distribution of meals in the acute period of the pandemic (March-April 2020).

During 2017, 736,352 meals were distributed (about 2,336 meals a day) 6 days a week from Monday to Saturday. The meals are prepared based on a winter menu that runs from January 1st to April 30th and from October 1st to December 31st (7 months) and a summer menu from May 1st to September 30th (5 months).

The number of users in 2017 was 17,936, of which 13% females (2332) and 87% males (15604). The age of the people who ate the meals provided by the canteen varied in most cases between 25 and 54 years (66.1%). The countries of origin of all users were also analyzed, and it is noted that the majority of users are Italian (13.7%) followed by the Moroccans (9.1%), Rumanians (7.3%) and other users from more than 143 countries .

The meals consisted of a first course (pasta or rice or gnocchi or soup or cous cous), a second course (red or white meat, or fish or cheese or eggs), a side dish (fresh vegetables or cooked vegetables or legumes), fresh fruit or a sweet packaged, 2 small breads. However, there is no limit to the need for fresh and filtered water

The type and amount of single recipe used for the preparation of the meals are represented in Figures 1-4 in which the average daily and weekly quantities and the weekly food frequencies were calculated, both for the winter menu and the summer menu.

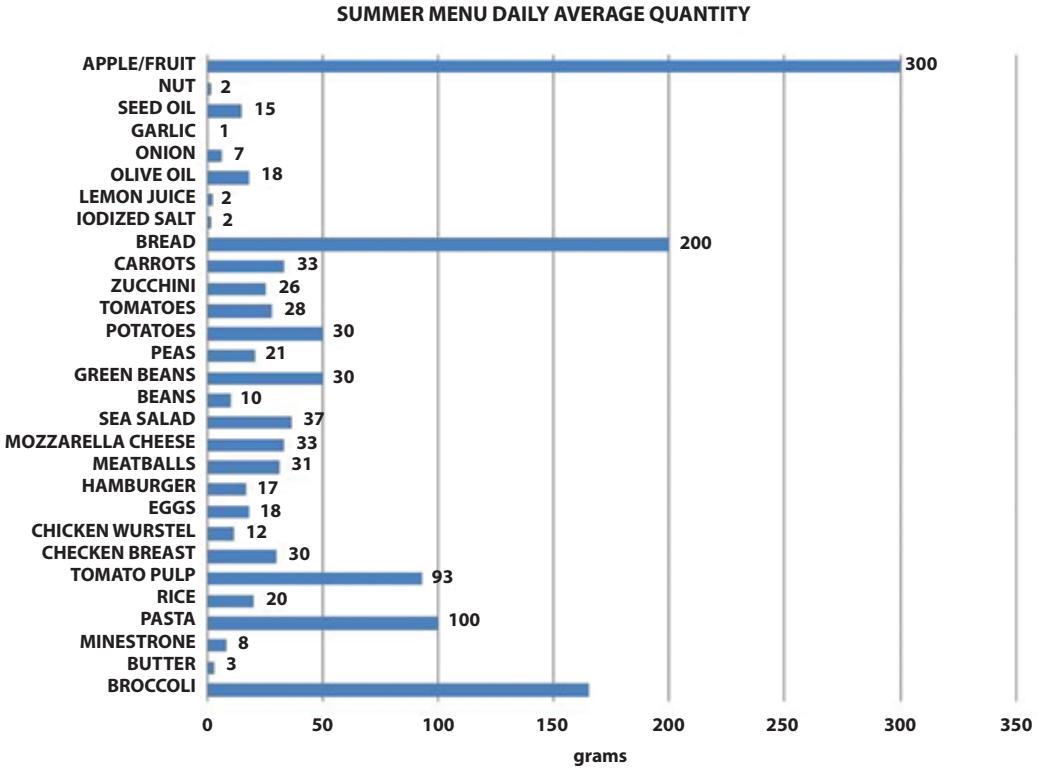

Figure 1. Summer menu: daily average quantity

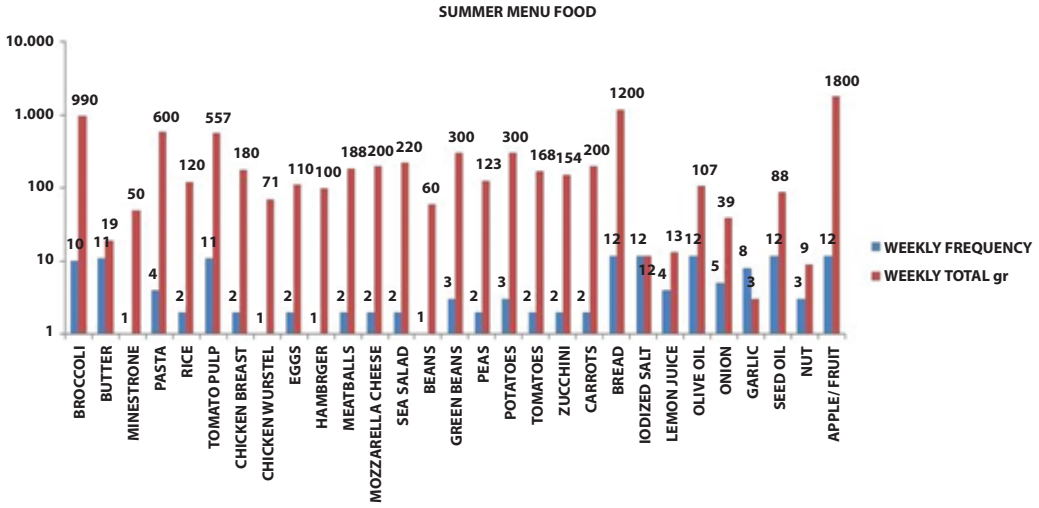

Figure 2. Summer menu food: weekly frequency, weekly total

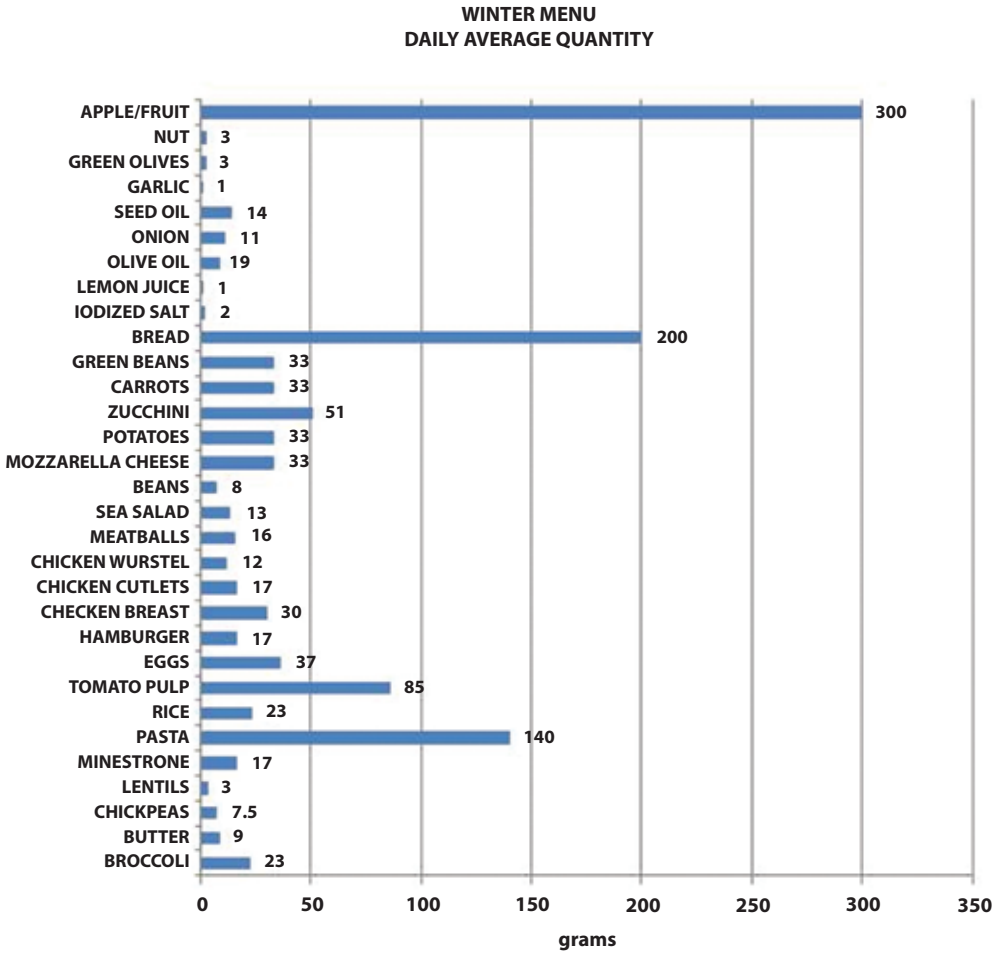

Figure 3. Winter menu: daily average quantity

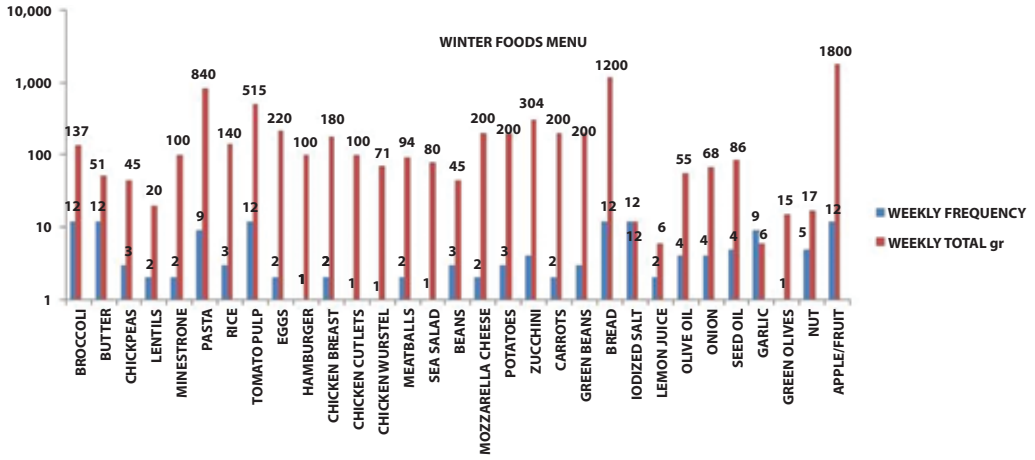

Figure 4. Winter menu food: weekly frequency, weekly total

Both menus contained different and varied quantities and types of food, in particular pasta and rice that are typical of the Mediterranean diet. In addition, the quantity and variety of vegetables were also well represented.

The results on the nutrient composition of both the winter and summer menus are shown in table 2.

Energy provided by the whole menu (lunch and dinner) resulted 2139 Kcal (14% protein, 27% lipids, 58% carbohydrates) for the summer menu, while the winter menu provided 2034 Kcal (15% proteins, 29% lipids, 56% carbohydrates). The amount and quality of proteins supplied, especially of animal origin, were on average sufficient to cover essential aminoacids need. The lipid share was well represented even if the monounsaturated fats were slightly lower than the Italian average intake. This was due to the difficulty in supplying olive oil. Polyunsaturated fatty acids provided were in line with the LARN reference intake (6% in both the summer and the winter menus). Even the carbohydrates, both complex and simple, were well represented (58% and 7%, respectively, in the summer menu and 56% and 7%, respectively, in the winter menu). The estimate of the vitamin supply through the menus was insufficient for vitamin D, folate, vitamins B2, B6 and B12 for which there was a deficiency of supply. This was due to the lack of foods such as dairy products and milk because many users, being of Arab nationality, did not tolerate milk and dairy products and there was also an insufficient supply of fresh vegetables and fish.

As regards minerals, an excess of sodium was envisaged because the quantity of iodized salt supplied daily for voluntary use was generally high (4 g per day), even if it is not possible to speculate that all the salt provided was actually used by the hosts.

There was also a low availability in the meals of calcium and zinc due to the lack of foods such as dairy products and milk, the possible contribution through water was not considered.

Economic and feasibility aspect

The resources that enable the correct and continuous functioning of the canteen can be classified in three main categories:

1. Donations from individuals;
2. Five per thousand of personal income tax (IRPEF);
3. Donation of good

Private donations and five per thousand IRPEF represent 84% of all the sources, with the donations of goods covering the remaining 16%.

Private donations, in turn, derive from testamentary legacies and voluntary donations in money made by private citizens and companies. The testamentary legacies increased conspicuously in the five-year period 2011–2015 compared to the previous five-year period, going from 120 to 153.

Table 2. Nutritional composition of menus

Dietary Components	Nutritional Factor	Winter Menu	Summer Menu
Energy Intake	Energy (kcal)	2139	2139
Protein and Amino Acids	Total protein (%)	15	14
	Isoleucine (mg)	3607	3720
	Leucine (mg)	5700	5811
	Lisine (mg)	4049	4017
	Methionine (mg)	1232	1253
	Phenylalanine (mg)	3111	3141
	Threonine (mg)	2796	2871
	Tryptophan (mg)	773	782
	Valine (mg)	3912	3995
	Arginine (mg)	3679	3654
Lipids	Total lipid %	29	27
	Lipid Saturates %	6	5
	Lipid monoinsaturates %	7	8
	Lipid polyunsaturated %	6	6
	Cholesterol (mg)	292	216
	ω 6 (%)	6	6
	ω 3 (%)	1	1
Carbohydrates	Carbohydrates (%)	56	58
	Simples sugar (%)	7	7
Fibers	Total Fiber g	25	26
Alcohol	Alcohol (g)	0	0
Vitamins	Vitamin A (μg)	1224	1338
	Folate (μg)	169	194
	Vitamin C (mg)	79	98
	Vitamin B3 (μg)	13174	12807
	Vitamin E (μg)	7983	9315
	Vitamin B2 (μg)	832	826
	Biotine (μg)	40	39
	Vitamin B6 (μg)	1171	1305
	Vitamin B12 (ng)	1883	1563
	Vitamin B1 (μg)	842	900
	Pantothenic Acid (μg)	3993	4347
	Vitamin K (μg)	50	68
	Vitamin D (ng)	1368	725

Dietary Components	Nutritional Factor	Winter Menu	Summer Menu
Minerals	Sodium (mg)	2526	2556
	Calcium (mg)	542	546
	Phosphorus (mg)	955	961
	Potassium (mg)	1983	2165
	Chlorine (mg)	1709	1809
	Magnesium (mg)	211	220
	Iron (μg)	11003	10433
	Zinc (μg)	6294	6257
	Copper (μg)	1527	1503
	Selenium (μg)	52	61
	Iodine (μg)	92	95
	Manganese (mg)	3390	3739
	Chromium (μg)	33	40
	Fluorine (μg)	365	388

Voluntary donations of money, on the other hand, increased during the last period thanks to a more favorable tax regimen. In fact, both individuals and companies can deduct donations from their income for an amount not exceeding 10% of the total income declared to the maximum amount of 70,000 euros per year (Article 14, paragraph 1 of Decree Law 35/05 converted into law No. 80 of 14/05/2005) or, alternatively, can deduct 26% of the amount donated up to a maximum of 30,000 euros from their gross tax (art.15, paragraph 1 letter i-bis of Presidential Decree 917/86).

In both situations, the advantage translates into a substantial reduction in taxes to be paid.

Five per thousand IRPEF, on the other hand, is a mechanism set up by the Italian legislation that allows individual taxpayers to choose where to allocate a portion of the IRPEF payable by legal persons to the State. In other words, the State waives this tax revenue to donate it to the institution chosen by the tax payer. In 2015, more than 50,000 taxpayers chose to allocate their 5 per thousand to the Opera San Francesco, with an increase of 43% compared to the previous year. This result placed the Opera San Francesco at twelfth place (by amount collected) in the national ranking of all the potential beneficiary associations.

Finally, there are the donations of foodstuffs coming from AGEA (Agency for the supply in Agriculture) and from food companies.

Everything is organized through the Food Bank; AGEA collects food surpluses on a monthly basis from the various companies and distributes them to the various charitable organizations. Obviously, there are also direct donations made by the various companies to the Opera San Francesco. The food donations, in terms of kg, mainly concern fruit, pasta and rice but there are also sweets, cheeses, frozen vegetables, meat and fish. All these donations of foodstuffs allow a saving on quantifiable purchases of around 38% of the total purchase value of the food necessary to guarantee correct canteen functioning . In addition, there are around 1000 free volunteers at the OSF canteen (2 shifts a day, lunch and dinner, 6 days a week with 7 volunteers per shift).

Based on income and expenses for the maintenance of the service, the cost has been calculated to be on average 8 euro per meal, representing the minimum price that the poor should pay for an equivalent meal.

Conclusions

The nutrition of homeless people is a problem highlighted in several European and non-European countries, in particular in the US and Canada (1).

While nutritional deficiencies are often reported, new resources are sought to cope with the continuous increase in the needs of indigent people (1) and the continuous and increased migratory flows. The need could be even increased due to the pandemic situation by considering the impact of restrictions on economic capacity causing new poor target in the population.

The Opera di San Francesco in Milan, feeding thousands of people for free every day, has been trying to improve their nutritional intake selecting both quantity and quality of foods for about 60 years. Overall, the evaluation here performed seems to support that the diet provided through both the winter and summer menus is on the whole well balanced and developed trying to follow an Italian-Mediterranean dietary pattern, in terms of food quantity and quality, despite the limitation of the type of food sources considered to be acceptable for all the hosts.

Moreover, these menus appeared to be appreciated by the users and it is rare to have witnessed food waste even if this has not been specifically evaluated.

Although the commitment to provide meals able to cover as much as possible the nutritional needs of the poor, we have showed an inadequate intake of several vitamins and minerals such as calcium, zinc, vitamin D, folate, vitamin B2, B6 and B12 and this should be accurately considered in order to plan potential mitigatory strategies of intervention. In this context, one obvious solution could be related to the modification of the composition of the meals in terms of food categories selected even if this does seem an easy task by considering the heterogeneous group of population (different for religion, food acceptability etc.) and affordability of the purchase of different type of foods. An alternative that should be taken into consideration could be also the reliability of some micronutrient integration, without major spending commitments.

As previously highlighted (10), the social importance of a table for the poor in which nutritional values tend to be balanced leads to the prevention of numerous chronic diseases typical of homeless people. Furthermore, the petty crime generated by the need to cope with the supply of essential resources for survival such as food could diminish.

The economic analysis shows that a constantly present and sustainable organization can be developed through a capillary involvement of the population and through tax regimes favorable to charity. In the future more attention and support should be given to these organizations in order to optimize the meals provided from a nutritional perspective and possibly developing also tracking actvities to assess the actual food intake and impact on this vulnerable target population.

Conflict of Interest: The authors declare that the research was conducted in the absence of any commercial of financial relationships that could be construed as a potenzial conflict of interest

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