



## FEEDcities project

The food environment description  
in cities in Eastern Europe and  
Central Asia - Republic of Moldova



**Technical report**  
**October 2017**



**ISPUP**

INSTITUTO DE SAÚDE PÚBLICA  
DA UNIVERSIDADE DO PORTO

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# Abstract

This technical report contains the results from the FEEDcities Project – Eastern Europe and Central Asia, a cross-sectional survey of the local urban food environment conducted in Chişinău, Republic of Moldova between June and August 2016. It characterizes the vending sites, the food offered and the nutritional composition of both industrial and homemade street foods. It also describes the nutritional composition of foods sold in supermarkets and fast-food outlets.

The study was conducted within a bilateral partnership between the World Health Organization and the Institute of Public Health of the University of Porto, in collaboration with the Faculty of Medicine, the Faculty of Nutrition and Food Sciences and the Faculty of Pharmacy of the University of Porto (WHO registration 2015/591370 and 2017/698514). The study was funded through a voluntary contribution of the Ministry of Health of the Russian Federation.

## Keywords

STREET FOOD,  
READY-TO-EAT FOOD  
NUTRITIONAL COMPOSITION  
TRANS FATTY ACIDS, SODIUM  
POTASSIUM, FOOD ANALYSIS  
REPUBLIC OF MOLDOVA

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## Abbreviations and acronyms

FAO	Food and Agriculture Organization of the United Nations
NCD	noncommunicable disease
TFA	<i>trans</i> -fatty acids

## Executive summary

This report provides an overview of the street food context in Chişinău, Republic of Moldova. The study had both positive and concerning results, highlighting areas that might be targeted by policy and action.

The Food and Agriculture Organization of the United Nations (FAO) and WHO have defined “street food” as “ready-to-eat foods and beverages prepared and/or sold by vendors and hawkers especially in streets and other similar places”. In many settings, especially in urban areas of low–middle-income countries, street food is diverse and constitutes a widely accessible, inexpensive food source, although it often includes high-energy-dense foods rich in fat, sugar and sodium. Previous research on street food has focused on food safety and not on its contribution to the diet of the population. Furthermore, little to no research has been conducted in the WHO European Region.

The main objective of the FEEDcities Project – Eastern Europe and Central Asia is to characterize the street food environment in cities in Eastern Europe and Central Asia. The study provides information for achieving some of the objectives of the WHO European food and nutrition action plan 2015–2020, such as creation of healthy food and drink environments and increasing surveillance, monitoring, evaluation and research. This report describes the characteristics of vending sites, the ready-to-eat food they offer and the nutritional composition (*trans*-fatty acids [TFA], sodium and potassium content) of the street foods most commonly available in Chişinău, the capital of the Republic of Moldova. The report also gives the nutritional composition of the processed and ultra-processed foods most frequently bought in supermarkets and fast-food outlets. The findings and conclusions of the study will contribute to implementation of the national food and nutrition programme 2014–2020 (1) and particularly to the design and implementation of population-based interventions to reduce TFA and sodium intake.

Between June and August 2016, random and systematic sampling procedures were used to identify street food vending sites in and around the central market of Chişinău (with a 1-km diameter buffer zone around the centre). Sites at which only unprepared fresh fruit was sold were not included in the study. A total of 328 eligible street food vendors were interviewed about characteristics of the vending sites and the types of ready-to-eat foods and beverages they sold. According to this assessment, random and systematic sampling was then used to select the vending sites from which the foods most commonly available in this setting would be sampled. Additional food samples were collected in randomly selected supermarkets and fast-food outlets in the study area from a predefined list of food categories in order to reflect the mixture of sites selling ready-to-eat foods in Chişinău. The 110 food samples collected corresponded to approximately four samples each of the 29 most commonly available foods, with 13 collected at street vending sites, 12 in supermarkets and 4 in fast-food outlets.

In order to characterize the street food offered, products were grouped as fruit (fresh or dried), beverages (any drink, alcoholic and non-alcoholic) and all foods other than fruit and beverages, which were classified as homemade (foods cooked and/or prepared at home or on the street) or industrial (produced by the food industry). Unprocessed (*in natura*) fruit and vegetables were not sampled for analysis as their composition is characterized in the literature.

The street food vending sites identified were mostly stationary (95.7%). The vendors were usually women (88.1%) and employees (89.6%). Generally, food was sold 7 days a week (86.9% of stationary vending sites) and during all four seasons (79.9%), regardless of the weather (81.2%).

A wide variety of homemade and industrial foods were sold, demonstrating a rich street food culture. Fruit was sold at only 2.5% of sites (mobile: 0.0%; stationary: 2.6%); foods other than fruit were available at 80.8% of the sites (mobile: 92.9%; stationary: 80.3%); and beverages were sold at 74.3% (mobile: 21.4%; stationary: 76.7%). Foods other than fruit were either only homemade (all, 21.5%; mobile, 69.2%; stationary, 19.1%), only industrial (all, 66.4%; mobile, 23.1%; stationary, 68.7%) or both (all, 12.1%; mobile, 7.7%; stationary, 12.3%). Soft drinks were available at 80.7% of sites selling beverages, water at 77.0%, fruit juice-based drinks at 57.6% and alcoholic beverages at 42.0%.

The foods analysed frequently contained high levels of TFA and sodium. In the most commonly available street foods, the mean TFA content per serving was highest for homemade sweet rolls (*chiflă*, 1.45 g) and *plăcintă* (savoury, 1.28 g; sweet, 1.01 g), corresponding to 65.3%, 57.9% and 45.6% of the recommended maximum daily intake of TFA (2000 kcal for an average adult), respectively. The highest mean sodium contents per serving were observed in homemade sweet rolls (774 mg),<sup>1</sup> sausage rolls (630 mg) and savoury *plăcintă* (528 mg), corresponding to 36.7%, 31.5% and 26.4% of the recommended maximum daily intake, respectively. The mean potassium content per serving was highest in industrial chocolate (216 mg), homemade sweet rolls (212 mg) and savoury *plăcintă* (175 mg), corresponding to 6.1%, 6.0% and 5.0% of the recommended daily minimum intake.

In food from supermarkets, the mean TFA contents per serving were highest in wafers (2.55 g), savoury pastries (0.99 g) and cakes (0.96 g), corresponding to 114.8%, 44.7% and 43.2% of the recommended maximum daily intake, respectively. The highest mean sodium contents per serving were found in dried noodles (1465 mg), savoury pastries (824 mg) and dried bread crumbs (457 mg), corresponding to 73.2%, 41.2% and 22.9% of the maximum daily intake. The mean potassium content per serving in these foods was highest for chocolate (331 mg), chips (230 mg) and sweet pastries (165 mg), corresponding to 9.4%, 6.5% and 4.7% of the recommended minimum daily potassium intake.

In food from fast-food outlets, the highest mean TFA content per serving was found in hamburgers (0.64 g), corresponding to 29.0% of the recommended maximum TFA daily intake. The highest mean sodium content per serving was found in *kebab* (1673 mg), corresponding to 83.6% of the recommended maximum daily intake. The mean potassium content per serving was highest for *kebab* (858 mg), corresponding to 24.4% of the recommended minimum potassium daily intake.

These results demonstrate high levels of salt and *trans* fats among foods sold in the urban environment of Chişinău. The highest TFA content was found in snacks (home-made or industrial) sold on the street and in supermarkets, which suggests common use of cooking fats and shortening containing TFA in preparing and manufacturing foods. Widely diverse foods were found to be rich in sodium, including “sweet” foods that consumers would not necessarily expect to contain high levels of salt. Fast foods and home-made and industrial snacks sold in the street and in supermarkets had the highest salt contents, indicating that excess salt is added during food preparation, not only by street food vendors but also in fast-food outlets and by the food manufacturing industry.

Although we excluded street vending sites that sold only fruit (e.g. market stalls), ready-to-eat fresh fruit was less widely available than other foods or drinks at many vending sites (e.g. kiosks) in urban Chişinău. Greater availability would ensure easier, more convenient access of urban residents to such foods as essential parts of a healthy diet. The wide availability of sugary drinks and alcoholic beverages is notable and is a concern in light of the increasing rates of obesity and other noncommunicable diseases (NCDs) in the country. As consumption of alcoholic drinks can result in excess calorie intake and in view of the high burden of alcohol-related NCDs, consideration should also be given to policies to control the availability of alcoholic beverages.

The types of food other than fruit on offer and the nutritional composition of foods sold on the street and in supermarkets and fast-food outlets in Chişinău indicate that the nutritional quality of ready-to-eat food available in Chişinău should be improved, although it will be important to preserve the important cultural and community role of market vendors in sustaining traditional foods and providing access to whole foods, such as fruit and vegetables. There are various practical policy options to ensure a healthier urban food environment, and these should be integrated into national policies in the

<sup>1</sup> Although it appears counterintuitive for a sweet food to have a high sodium content, similar findings have been made in other countries. Thus, salt is “hidden” in foods that are not perceived to be salty or savoury.



Republic of Moldova. The national food and nutrition programme 2014–2020 could be used as an entry point to improve the food environment and to increase the availability of fruit and vegetables. It provides for action in the agricultural and education sectors, use of taxation and prices policies, establishment of legal limits on sodium and elimination of *trans* fats. These provisions have not yet been fully implemented. Once they have, actions will be accelerated to promote healthy diets and prevent obesity and other NCDs. The data presented here will provide an additional incentive.

Reducing the salt content of ready-to-eat foods sold in the street, at fast-food outlets and in supermarkets will probably require a multi-pronged approach. One will be health promotion to convince street food vendors and small producers to use less salt, and another will be to raise awareness among the public about the high salt content of such foods and the health effects of excess consumption. Another, increasingly important component of changing the food context is the adoption of targets for reducing salt in industrially produced food (e.g. savoury snacks and fast foods). The national programme and the national action plan 2014–2020 include a salt reduction target, which is to reduce by 30% the mean population intake of salt to result in an intake of < 8 g/day. Policies to help achieve this target could include setting maximum limits for salt in specific food categories through regulation, which would apply to all foods on the market, including in supermarkets and fast-food establishments, to ensure nondiscrimination. The nutritional information on packaged foods in the country could be improved to ensure that all packages bear a nutrient declaration (including sodium) in addition to an ingredients list. A draft law on providing information to consumers, including nutrition facts and front-of pack labelling for salt/sodium, has been endorsed on the first reading by the Parliament of the Republic of Moldova. Its provisions are harmonized with European Union legislation.

Cooking fats and pastry shortening containing TFA are widely used in food preparation. Legislation targeted directly at producers of industrial fats and manufactured foods, prohibiting the use of hydrogenated fats and oils in food production is recommended. This might set a maximum limit of 2 g *trans* fat per 100 g of total fat. Encouraging producers such as bakers and vendors to use healthier fats and oils in their recipes is a practical policy option for moving towards a healthier street food environment.

Specific recommendations for the Republic of Moldova are listed below.

- Consider the implications of this study, with other national data on the composition of foods, dietary patterns and salt intake, in preparing a sodium reduction strategy consistent with Appendix 3 of the WHO Global Action Plan on NCDs and the WHO European Food and Nutrition Action Plan 2015–2020.
- Consider the implications of this study for exploring the feasibility of regulatory measures to prohibit the use of industrially produced *trans* fats in food products.
- Assess national capacity for analysing foods in order to monitor progress and enforce national policies.
- Take into consideration the findings on the wide availability of sugar-sweetened beverages, notably in the context of child and adolescent obesity and dental caries, and consider policies to reduce the intake in this age group.

ALEX NEOSIM SRL

PIINE= DAR =  
c/1de seara in forma  
0,4kg

6-00 LEI

ALEX NEOSIM SRL

PIINE= GRI =  
c/1 pe vatra  
0,5kg

5-75 LEI

ALEX NEOSIM SRL

PIINE = GRI =  
c/2 in forma  
0,5kg

5-00 LEI

ALEX NEOSIM SRL

FRANZELA  
P/TARTIWE

4,50

ALEX NEOSIM SRL

FRANZELA=CODRU=  
0,4 kg

4-25 LEI

ALEX

IM  
= S

4-00

# 1. Introduction

The Republic of Moldova is a landlocked country located in the eastern region of Europe, with about 3.6 million inhabitants. Currently, a low birth rate and migration of the working-age population are reducing the population (2). The economy is low–middle income, with an annual gross domestic product of US\$ 6.75 billion. Although the Republic of Moldova is one of the poorest countries in Europe, its economy has been growing by an average of 5% annually (3), and significant progress has been made in reducing poverty since the early 2000s. Between 2003 and 2014, the national poverty line (the threshold for a person’s minimum needs for nutrition, clothing and shelter) fell from 29% to 11.4% (3,4). The capital city, Chişinău, is the largest city in the country, with an estimated population of more than 745 500 (5,6); 58% of inhabitants live in rural areas (2,3). Life expectancy at birth increased from 67.8 years in 2000 to 72.0 years in 2013 (2).

The Republic of Moldova has a high burden of noncommunicable diseases (NCDs). The mortality rate from cardiovascular disease is almost twice the European average (2), and ischaemic heart disease (38.5%), stroke (15.7%) and hypertensive heart disease (2.7%) are the leading causes of death. Cirrhosis of the liver (7.1%) and chronic obstructive pulmonary disease (2.4%) are also among the five main causes of death in the country (5). Mortality from cancer is increasing (from 13.3% of all deaths in 1990 to 14.4% in 2015 (6)), in contrast to the downward trends in most other European countries (2). The prevalence of overweight and obesity is increasing and, in 2014, WHO estimated that 47% of the population aged > 18 years was overweight and 15% obese. Other risk factors associated with the growing burden of NCDs include diet, high blood pressure, smoking (mainly among males) and excessive alcohol consumption (2).

Many countries in the WHO European Region have experienced a dietary transition in recent decades as a result of growing urbanization and the globalization of the processed food supply chain (7). The dietary changes include decreased consumption of foods rich in fibre, such as legumes, fruits, vegetables and whole grains, and more frequent consumption of processed foods, which are more likely to be energy-dense and rich in fats, sugar and salt (8) and therefore associated with a greater frequency of weight gain and NCDs. Consistent evidence shows that industrially produced *trans* fatty acids (TFA) and sodium increase the risk for cardiovascular disease (9). WHO is advocating for complete elimination of TFA from the global food supply (9), and public authorities in several countries have effectively banned or regulated them (10). WHO also calls for a significant reduction in sodium intake (11). Most dietary sodium comes either from addition of salt during the preparation and cooking of food or from processed foods. Salt reduction activities are based on three main pillars: product reformulation, public awareness and clear rules for nutrition labelling (11). WHO recommends no more than 2000 mg of sodium per day for the adult population, corresponding to 5 g/day of salt, in order to reduce blood pressure and the risk for cardiovascular disease (12). In most countries for which recent data are available, however, the dietary sodium intake is much higher (13). Potassium, another key nutrient, is inversely associated with blood pressure, and WHO recommends a minimum daily intake of 3510 mg in order to reduce the risk for cardiovascular disease (14).

Despite substantial improvements in health in the Republic of Moldova during the past decade, national figures for many indicators are still below the average of the WHO European Region. Few data are available on nutritional status, dietary behaviour and food composition in the country; however, it has been estimated that 67% of the population consume fewer than five servings of fruit and vegetables per day (15). To make further progress in health, the national policies have been aligned with Health 2020, including promoting healthy diets for the prevention and control of NCDs (2). For example, a national food and nutrition programme for 2014–2020 (1), which has been endorsed by the Government, proposes a wide spectrum of activities for ensuring a healthy diet, although implementation has lagged.

## Street food in Chişinău

The Food and Agriculture Organization of the United Nations (FAO) and WHO define street foods as “ready-to-eat foods and beverages prepared and/or sold by vendors or hawkers especially in the street and other similar places” (16). Globally, street food is a cultural, social and economic phenomenon typical of urban areas, where the lifestyle is becoming more sedentary and the time dedicated to cooking at home has decreased dramatically (17). Street food can be an important component of the daily diet and also plays an important community role by providing high-fibre foods rich in micronutrient (fruit and vegetables) and preserving traditional foods and diets. Nevertheless, foods purchased on the street may also contribute significantly to excess energy and nutrient intake; however, this aspect has been little studied, and more

attention should be paid to the nutritional quality of foods available at street vending sites and markets. Furthermore, the expansion of supermarkets and fast-food outlets in urban settings in low- and middle-income countries has led to drastic changes in the food supply and in food purchasing patterns, with consequent dietary changes (18).

It is important to characterize and monitor the types of ready-to-eat food offered and purchased in the context of the prevention of NCDs. To date, research in low- and middle-income countries has focused mainly on hygiene and food security (19), and little is known about the nutritional characteristics of ready-to-eat food. In the Republic of Moldova, there is no routine surveillance of food composition or dietary habits. During planning of the study reported, it was observed that, unlike some other cities in which research on street food has been conducted, Chişinău has few vendors who sell food on the streets. Thus, the usual “street hawkers” or mobile vendors commonly found in other parts of the world are missing, and the urban food environment is mixed, with a visible transition to kiosks and supermarkets. Nevertheless, informal stalls, push carts, trucks and kiosks selling food in the street are still frequent in central Chişinău, within and in the vicinity of the central market. Therefore, the study method was adapted to the local context and included both street food in the classical sense and ready-to-eat food sold in small formal supermarkets and fast-food outlets.

## Objectives

The aim of this study was to characterize the food environment of urban Chişinău. The specific objectives addressed in this report were:

- to describe the characteristics of the street food vending sites;
- to characterize the street food offered at selected vending sites;
- to assess the ready-to-eat foods other than fruit sold in the street;
- to assess the TFA, sodium and potassium contents of processed and ultra-processed foods sold in supermarkets; and
- to assess the sodium, potassium and TFA contents of ready-to-eat foods sold in fast-food outlets.

## 2. Methods

A cross-sectional evaluation of street food vending sites was conducted in Chişinău between 20 June and 1 August 2016. Samples were collected from street vendors, supermarkets and fast-food outlets in order to provide a general picture of the foods available in Chişinău.

The study protocol was developed by the University of Porto with the WHO Regional Office for Europe and was approved by the ethics committees of the Institute of Public Health of the University of Porto and the National Centre of Public Health, Republic of Moldova.

Staff and consultants from the WHO Regional Office for Europe recruited and trained 10 local interviewers (seven women and three men). The 5-day training course comprised lectures, demonstrations and practice interviews with the questionnaire for data collection.

### Food from street vendors

#### Eligibility criteria

We used the definition of street food proposed by FAO and WHO, “ready-to-eat foods and beverages prepared and/or sold by vendors or hawkers especially in the streets and other similar places” (16), which includes prepared (e.g. sandwiches, salads) and cooked (e.g. boiled eggs, traditional foods) products and raw foods to be consumed immediately (e.g. fruits, nuts), even if some products may be consumed later, at home or at work.

Eligible vending sites were those selling ready-to-eat food, beverages or snacks at any site other than a permanent shop, business or establishment with four permanent walls that did not sell directly to the street, within a predefined perimeter. It included mobile street hawkers and sellers with semi-static or stationary vending units. Vending sites at which only unprepared fresh fruit was sold were not eligible, as large amounts are often bought at these sites for household consumption, which does not comply with the definition of “ready-to-eat” food used.

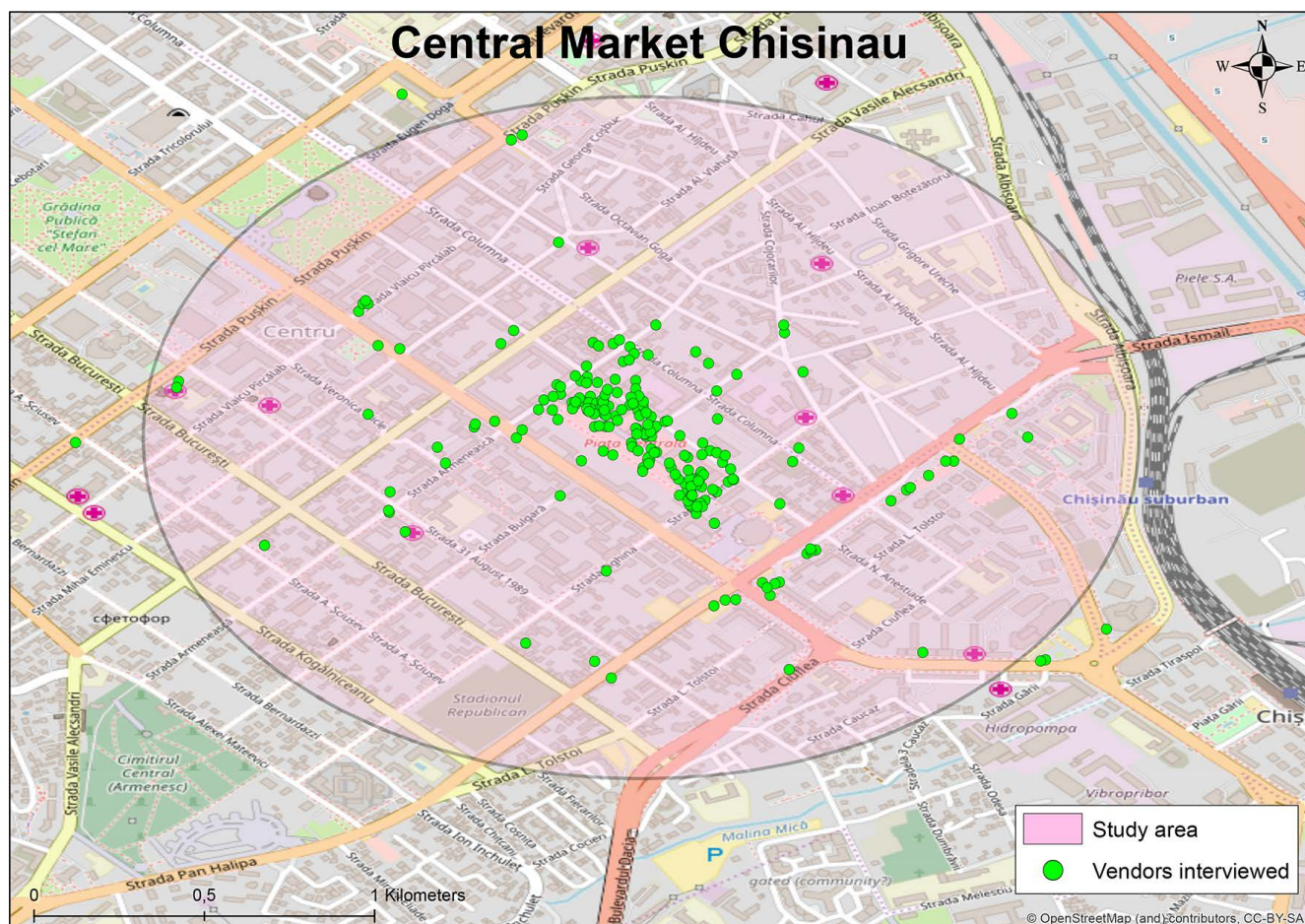
### Sampling of vending sites

Most of the vending sites were concentrated in the central market and its surroundings. Sampling began by defining the study area, with a 1-km diameter around a central point (the central market). After the perimeter of the buffer zone had been identified, the study area was divided into 19 sections, with the central market (the centre of the buffer zone) divided into six sections. All the eligible vendors in the study area were invited to participate.

Sections were evaluated on consecutive days. Each day, pairs of field researchers canvassed street food vendors in a section, by walking through any publicly accessible street within the zone. If assessment of the section was completed before the end of the day, the next section was canvassed, until the end of the day. This process continued until all 19 sections had been covered.

After registering the GPS coordinates of each vending site, the field researchers approached the vendor to explain the study objectives and procedures and to ask the vendor for general consent to participate in data collection. If the vendor agreed, the interviewers administered the structured questionnaire (approximately 10 min) on food vending activity and the food offered. Of 439 street food vendors approached, 328 agreed to participate (74.7% participation rate). The vending sites included in the study are shown in Fig. 1.

**Fig. 1. Map of food vending sites in Centru district, Chişinău, Republic of Moldova**



In order to avoid interviewing the same vendor twice and to facilitate recognition of vendors who had already been approached, a sticker with the logo of the research project was attached to the vending site at the end of the interview, with the vendor’s agreement. The field researchers were instructed to answer any questions the vendors might have about the purpose of the study and to give them leaflets describing the study.

### Characterization of vending sites and food offered

The data collected included the sex of the food vendors and whether they owned their business. The physical setup (e.g. stand, truck, kiosk), working days, number of employees and access to clean water and electricity were ascertained by direct observation and interviews with the vendors who agreed to participate.

The data on the ready-to-eat foods offered included type of food product, size of portions, preparation and packaging. Foods were grouped as fresh or dried fruit, all foods other than fruit and beverages and any alcoholic and non-alcoholic drink. Foods other than fruit and beverages were further classified as homemade (cooked and/or prepared at home or on the street, even with industrial ingredients) or industrial (produced by the food industry and sold with no further preparation). Beverages were classified into: soft drinks, water, fruit juice-based drinks, fresh fruit juice, milk, alcoholic beverages, energy drinks, coffee, tea and other beverages.

### Selection and collection of food samples

After the street food vending sites had been characterized according to the food they offered, the seven most frequently available homemade foods, including traditional beverages of unknown composition, and the six most frequently available industrial foods were selected for analysis. Common drinks of known nutritional composition, such as coffee, tea, milk and soft drinks, were not analysed. A total of 52 samples were collected, corresponding to an average of four samples of each of the 13 foods identified. The food samples collected corresponded to one unit or the usual portion sold. Samples of foods sold in small portions (e.g. small snacks, biscuits) contained the number of portions usually purchased and consumed. The 13 food samples are depicted in annexes 1–3.

For sampling (Table 1), each of the selected homemade (1–7) and industrial (8–13) foods was collected at four vending sites. On 7 consecutive days, including weekends, four homemade and four industrial samples were collected in one area, in the same order as that used for the initial assessment of vending sites. Thus, eight samples of foods were collected each day, until 52 samples had been collected. On day 7, only four samples of homemade foods were collected.

**Table 1. Framework for random sampling of food from street food vending sites**

Day	Homemade food				Group	Industrial food				Group
1	1	2	3	4	A	8	9	10	11	B
2	5	6	7	1	C	12	13	8	9	D
3	2	3	4	5	E	10	11	12	13	F
4	6	7	1	2	G	8	9	10	11	H
5	3	4	5	6	I	12	13	8	9	J
6	7	1	2	3	K	10	11	12	13	L
7	4	5	6	7	M					

The vending sites at which food samples were collected were selected by a random route procedure. Randomly selected GPS coordinates within each study area were used as the starting point for a systematic selection procedure, in which field researchers moved northwards and then clockwise towards the east, continuing through the south and west to the limits of the study area or a physical barrier (e.g. a wall or a canal), until they reached a site at which the selected foods were available. In each market and on each day of collection, only one food sample was obtained from the same vendor, the most common foods being selected first.

## Food from supermarkets

In the absence of a representative national nutrition survey or other data on the foods commonly consumed or available in the Republic of Moldova, a preliminary desk review was performed to identify a method for sampling relevant processed and ultra-processed foods that people are likely to buy. Publications and reports from other European countries (20–25) were used to draw up a list of foods likely to be available in supermarkets and to identify the most popular foods in each category, as the basis for food sampling.

The food categories sampled in supermarkets were:

- bread,
- biscuits and wafers,
- chocolate and confectionery,
- cakes,
- sweet pastries,
- savoury pastries,
- fat spreads and shortening,
- crisps,
- crackers and dried bread crumbs,
- breakfast cereals,
- processed meats, and
- processed ready-to-eat meals.

All supermarkets operating in the study area, obtained from OpenStreetMap, were listed. OpenStreetMap defines supermarkets as large, full-service grocery shops that often also sell a variety of non-food products. *Alimentara*, which are small markets in Chişinău, were also included and are referred to broadly as supermarkets. The sites were visited by the team of interviewers, who mapped their coordinates and street addresses (Fig. 1 and Table 2).

**Table 2. List of supermarkets in the study area**

Name*	Address	Completed interview
Alen Market	Strada Bucureşti	No
Alimentara Ariana	Strada Sfântul Gheorghe 34/1	No
Alimentara Danju-Lux SRL	Strada Vasile Alecsandri 47	Yes
Alimentara El Al II SRL	Strada Tighina 23	No
Alimentara SRL BadinMag	Strada George Coşbuc 16	Yes
<b>Fidisco</b>	<b>Boulevard Ştefan cel Mare 6</b>	<b>Yes</b>
Green Hills	Dimitrie Cantemir Boulevard 6	Yes
<b>IMC Market No7</b>	<b>Dimitrie Cantemir Boulevard 9</b>	<b>Yes</b>
Market Proelitex plus SRL	Strada Bulgară 54	Yes
<b>Nr 1</b>	<b>Strada Puşkin 32</b>	<b>Yes</b>
SRL Serduza Alimentara	Strada Ismail 100/2	Yes
Stelim-Onest SRL Alimentara	Strada Ismail 102/3	Yes
Unimarket	Strada Vasile Alecsandri 143	Yes

\* Those selected are in bold.





Once a supermarket had been identified, the field team approached the manager to explain the study objectives and procedures, obtain general oral consent and enquired about the most popular products on the list of 12 food categories; 10 of the 13 managers agreed to be interviewed (Table 2). A list of the most popular products in each of the food categories was defined on the basis of the replies.

Three of the 10 establishments in which the managers agreed to be interviewed were randomly selected for collection of food samples. When available, four different brands of each item were sampled. If the product was unbranded or unpackaged, examples from four different supermarkets were sampled. A total of 42 samples were collected.

## Food from fast-food outlets

A list of foods likely to be available in fast-food outlets in Chişinău was generated after in loco observation and was used to identify the most popular foods in each category as a basis for sampling.

The food categories sampled were hamburgers, fried potatoes, pizza and kebab.

As for supermarkets, the fast-food outlets at which food samples were bought were selected randomly from a list of all the fast-food outlets operating in the study area, obtained from OpenStreetMap, and subsequent identification of those sites in the field by interviewers using coordinates and street addresses (Fig. 1). OpenStreetMap defines a fast-food outlet as a place where “food is paid for at the counter prior to consuming. Food is served on disposable plates or other material, and eaten with plastic utensils. They usually, but not always, have sit-down facilities ranging from two or three to many easy-to-clean chairs and tables.”

After an explanation of the study objectives and procedures and obtaining general oral consent, 9 of the 18 managers (Table 3) agreed to participate in an interview about the most popular products on the list. After the interview, one item in each of the four categories, except for hamburgers, was purchased at each outlet. For instance, if the outlet sold both fried potatoes and *kebab*, the most popular type of each of these foods was purchased, and the remaining three samples were purchased at different outlets. This was done at all the fast-food outlets until four samples of each of the four food categories had been purchased, resulting in a total of 16 samples.

## Processing of food samples for analysis

Four representative aliquots of each sample were homogenized or grounded mechanically, weighed and packed individually in labelled rigid plastic containers. After packaging, each container was weighed again and stored in a freezer (−18 °C) until analysis.

Before analysis, samples were defrosted, and the total weight was compared with that before freezing to detect any moisture loss during storage and shipment to Porto, Portugal, for analysis; they were then homogenized and immediately analysed for moisture. They were then analysed for TFA, sodium and potassium content. For TFA analysis, the fat fraction was extracted with organic solvents, and a portion was separated by gas chromatography after conversion to fatty acid methyl esters, as described elsewhere (26). Sodium and potassium were analysed by flame photometry according to the method of Vieira et al. (27).

## Statistical analysis

The street food environment was characterized by descriptive statistics and spatial analysis. The locations of the vending sites were mapped, and the characteristics of the sites and the food they offered are presented as proportions.

The TFA, sodium and potassium contents of each food are presented as means and ranges per serving and as the mean proportion of the recommended intake of each nutrient. Mean serving sizes, calculated as the mean of individual samples collected for each food, are also presented.

**Table 3. List of fast-food outlets in the study area**

Name	Address	Completed interview
Andy's Pizza	Bulevardul Ștefan cel Mare și Sfânt 64	No
Andy's Pizza	Strada Armenească 45a	No
<b>Andy's Pizza</b>	<b>Strada Ismail 45</b>	<b>Yes</b>
Andy's Pizza	Strada Pușkin 32	No
Andy's Pizza	Strada Vlaicu Pîrcalab 63	No
<b>Blinoff</b>	<b>Strada N. Anestiade</b>	<b>Yes</b>
<b>Cafe Bistro</b>	<b>Strada Mitropolitul Varlaam 65</b>	<b>Yes</b>
Cantina	Strada Mitropolitul Varlaam 79	No
Gălbenuș	Strada Vlaicu Pîrcalab 75	No
<b>Gold Kebab</b>	<b>Strada Ismail 98/4</b>	<b>Yes</b>
IT Cafe	Strada Alexandru cel Bun	No
<b>Kebabos</b>	<b>Strada Pușkin</b>	<b>Yes</b>
<b>McDonald's</b>	<b>Bulivard Ștefan cel Mare</b>	<b>Yes</b>
<b>Pepe Pizza Risto-Pub</b>	<b>Strada 31 August 1989 58</b>	<b>Yes</b>
<b>Pizza Mania</b>	<b>Strada Ismail 88</b>	<b>Yes</b>
Pizza Mania	Strada Pușkin	No
Spicisorul de aur	Strada Tighina 44	No
<b>Star Kebab</b>	<b>Strada Ismail</b>	<b>Yes</b>

\*Selected fast-food outlets are highlighted in bold.

## 3. Results

### Street food vending sites

#### Characteristics of vending sites and vendors

Most vendors were women (88.1%) who operated a stationary vending site (95.7%) and were employees (89.6%). Several types of vending structure were observed (Table 4), the most prevalent being a stand, stall or booth (35.4%), followed by a kiosk (29.6%) or fast-food units serving traditional fast food directly onto the street through a window (8.6%).

Almost all street food vendors had access to a toilet (97.0%). When stationary vendors were asked where they usually washed their hands during the day, 78% replied "bathroom" and 28.7% replied "basin"; four vendors reported that they had no place to wash their hands. Access to electricity was reported by 88.9% of stationary vendors.

Most stationary vendors reported that they sold food throughout the week (86.9%), in all four seasons (79.9%), regardless of the weather (81.2%).

#### Characteristics of street food offered

Fruit was available at 2.5% of the vending sites, although only in stationary establishments (2.6%). Beverages were sold at 74.3% of the sites (mobile: 21.4%, stationary: 76.7%), and foods other than fruit were available at 80.8% of sites (mobile: 92.9%, stationary: 80.3%) (Table 5).

**Table 4. Types of stationary vending site (n = 314)**

Stand, stall or booth	35.4%
Kiosk	29.6%
Fast-food units*	8.6%
Refrigerator	8.3%
Kvas barrel**	7.6%
Bench with table	6.1%
Truck	2.2%
Ice-cream machine	1.6%
Push cart	0.3%
Table with chairs for customers	0.3%

\* Restaurant serving traditional fast food selling directly on the street through an open window.

\*\* Vending site consisting of a portable metal barrel containing kvass, a traditional drink.

**Table 5. Foods offered at street food vending sites, by type of vendor\***

Food offered	Mobile (n=14) %	Stationary (n=314) %	Total (n=328) %
Fruit	0.0	2.6	2.5
Food other than fruit	92.9	80.3	80.8
Industrial	23.1	68.7	66.4
Homemade	69.2	19.1	21.5
Homemade and industrial	7.7	12.3	12.1
Beverages*	21.4	76.7	74.3

\*Sample size is lower due to missing data during data collection (n=327).

More street food vending sites sold only industrial food (all, 66.4%; mobile, 23.1%; stationary, 68.7%) than sold exclusively homemade food other than fruit (all, 21.5%; mobile, 69.2%; stationary, 19.1%); 12.1% of vending sites (mobile, 7.7%; stationary, 12.3%) sold both homemade and industrial foods other than fruit.

The most common homemade foods sold by stationary vendors in the streets of Chişinău were savoury *plăcintă* (51.9%), sausage rolls or hot dogs (41.8%), savoury *pateuri* (30.4%) and sweet rolls (27.8%). Table 6 shows the main characteristics of these foods with regard to their preparation, packaging and storage temperature. Overall, the majority of stationary vendors sold foods prepared on the same day (with a variation from 68.2% for sweet rolls to 100.0% for *pateuri*), prepared at the vending site (27.3% for sweet rolls and 79.2% for *pateuri*) or bought from another vendor or shop (20.8% for *pateuri* and 72.7% for sweet rolls), manufactured by a baker (54.2% for *pateuri* and 86.4% for sweet rolls), unpackaged (95.5% for sweet roll and 100.0% for *plăcintă* and sausage rolls) and stored at room temperature (87.9% for sausage rolls and 100.0% for *pateuri*).

**Table 6. Characteristics of a subsample of the most common homemade foods offered at 79 stationary vending sites**

Characteristic	<i>Plăcintă*</i> (savoury, n = 41) No. (%)	Sausage roll or hot dog (n = 33) No. (%)	<i>Pateuri*</i> (savoury, n = 24) No. (%)	Sweet roll ( <i>chiflă*</i> , n = 22) No. (%)
<b>Date of preparation</b>				
Same day	35 (85.4)	27 (81.8)	24 (100.0)	15 (68.2)
1 day earlier	6 (14.6)	6 (18.2)	–	7 (31.8)
2 days earlier	–	–	–	–
> 2 days earlier	–	–	–	–
<b>Place of preparation</b>				
At home	–	–	–	–
At the vending site	13 (31.7)	20 (60.6)	19 (79.2)	6 (27.3)
Both at home and at the vending site	2 (4.9)	1 (3.0)	–	–
Bought from another vendor or shop	26 (63.4)	12 (36.4)	5 (20.8)	16 (72.7)
Restaurant or cafeteria	–	–	–	–
<b>Food handler or preparer</b>				
Baker	33 (80.5)	18 (54.5)	13 (54.2)	19 (86.4)
Owner	1 (2.4)	–	1 (4.2)	–
Seller	7 (17.1)	15 (45.5)	10 (41.7)	3 (13.6)
Does not know	–	–	–	–
<b>Packaging</b>				
Industrially packaged	–	–	–	–
Manually packaged	–	–	1 (4.2)	1 (4.5)
No package	41 (100.0)	33 (100.0)	23 (95.8)	21 (95.5)
<b>Storage temperature at time of sale</b>				
Cold	2 (4.9)	4 (12.1)	–	1 (4.5)
Warm	–	–	–	–
Room temperature	39 (95.1)	29 (87.9)	24 (100.0)	21 (95.5)

\* Traditional homemade snacks. *Plăcintă* is a fried pastry, usually made with dough made from flour, water and sunflower oil filled with cheese, vegetables, meat or potatoes or a sweet filling, usually served in a pie shape, but can assume various shapes. *Pateuri* is a fried pastry made with leavened dough filled with cheese, vegetables or meat, usually in an oval shape and served individually. *Chiflă* is a sweet roll or bun made of leavened dough (either flaky or brioche type), usually filled with a sweet filling such as chocolate, vanilla or cherry cream.

## Beverages

A high diversity of beverages was available almost exclusively in stationary street food vending sites in Chişinău (Table 7). The most commonly beverages sold were soft drinks (80.7%), water (77.0%), fruit juice-based drinks (57.6%), alcoholic beverages (42.0%) and coffee (32.5%). Coffee and tea were available in the 3 mobile vending sites selling beverages whereas alcoholic drinks were not available in those vending sites.



**Table 7. Type of beverages offered at street food vending sites in Chisinau, Republic of Moldova by type of vendor (n=243)**

	Total (n=242)	Stationary (n=239)	Mobile (n=3)
<b>Type of beverages (%)</b>			
Soft drinks	80.7	80.8	66.7
Water	77.0	77.5	33.3
Fruit juice-based drinks	57.6	57.9	33.3
Alcoholic beverages	42.0	42.5	0.0
Beer	24.7	25.0	0.0
<i>Kvass*</i>	18.5	18.8	0.0
Distilled beverages and cocktails**	2.9	2.9	0.0
Alcopop	1.2	1.3	0.0
Wine	0.8	0.8	0.0
Coffee	32.5	31.7	100.0
Energy drinks	31.3	31.7	0.0
Tea	28.4	27.5	100.0
Fresh fruit juice	7.0	7.1	0.0
Milk	2.5	2.5	0.0
Other beverages***	1.7	1.7	0.0

\*A traditional fermented beverage made from rye bread, usually slightly alcoholic.

\*\* Includes brandy, vodka, whiskey, mojito and gin and tonic.

\*\*\* Includes hot chocolate, *kefir* and milkshake.

## Nutritional composition of food collected

### Foods from street food vending sites

A wide variety of street food products were analysed, which were mostly cakes, pastries and snacks, with substantial differences in TFA, sodium and potassium contents.

The mean TFA content per serving was highest in homemade sweet rolls (1.45 g), homemade *plăcintă* (savoury: 1.28 g; sweet: 1.01 g) and industrial chocolate (0.67 g), corresponding to 65.3%, 57.9%, 45.6% and 30.3% of the recommended maximum daily TFA intake (2000 kcal for an average adult), respectively. The mean TFA content per serving was lowest in homemade sweet doughnuts (0.11 g), sausage rolls (0.11 g), industrial *kvass* (0.04 g) and industrial pretzels (0.01 g), corresponding to 5.2%, 5.2%, 1.9% and 0.9% of the recommended maximum daily intake.

The highest mean sodium contents per serving were found in homemade sweet rolls (774 mg), sausage rolls (630 mg), savoury *plăcintă* (528 mg) and *cheburec* (474 mg), corresponding to 36.7%, 31.5%, 26.42% and 23.7% of the recommended maximum daily intake, respectively. The lowest mean sodium contents per serving were observed in industrial biscuits (57 mg), ice-cream (30 mg), *kvass* (22 mg) and chocolate (2 mg), corresponding to 2.8%, 1.5%, 1.1% and 0.1% of the recommended maximum daily intake, respectively.

The mean potassium content per serving was highest in industrial chocolate (216 mg), homemade sweet rolls (212 mg), savoury *plăcintă* (175 mg) and *pateuri* (158 mg), corresponding to 6.1%, 6.0%, 5.0% and 4.5% of recommended minimum daily potassium intake. The mean content per serving was lowest in industrial pretzels (57 mg), biscuits (55 mg), homemade sweet doughnuts (29 mg) and industrial *kvass* (14 mg), corresponding to 1.6%, 1.6%, 0.8% and 0.4% of the daily recommended minimum intake.

### Food from supermarkets

The mean TFA contents per serving were highest in wafers (2.55 g), savoury pastries (0.99 g), cakes (0.96 g) and fat spreads and shortening (0.29 g), corresponding to 114.8%, 44.7%, 43.2% and 13.3% of recommended maximum daily intake, respectively. The mean TFA content per serving was lowest in dried noodles (0.10 g), crisps (0.01 g), breakfast cereals (0.00 g) and industrial bread (0.00 g), corresponding to 4.5%, 0.7%, 0.1% and 0.0% of the recommended maximum daily intake.

The highest mean sodium contents per serving were observed in dried noodles (1465 mg), savoury pastries (824 mg), dried bread crumbs (457 mg) and sweet pastries (286 mg), corresponding to 73.2%, 41.2%, 22.9% and 14.3% of the recommended maximum daily intake. The lowest mean contents per serving were observed in wafers (92 mg), crisps (78 mg), chocolate (12 mg) and fat spreads and shortening (1 mg), corresponding to 4.6%, 3.9%, 0.6% and 0.0% of the recommended maximum daily intake, respectively.

The mean potassium content per serving was highest in chocolate (331 mg), crisps (230 mg) and sweet (165 mg) and savoury pastries (145 mg), corresponding to 9.4%, 6.5%, 4.7% and 4.1% of the recommended minimum daily potassium intake. The mean content per serving was lowest in dried bread crumbs (71 mg), industrial bread (65 mg), processed meats (63 mg) and fat spreads and shortening (6 mg), corresponding to 2.0%, 1.8%, 1.8% and 0.2% of daily recommended minimum potassium intake.

### Food from fast-food outlets

The highest mean TFA content per serving was found in hamburgers (0.64 g) and the lowest in *kebab* (0.11 g), corresponding to 29.0% and 5.2% of the recommended maximum daily intake, respectively.

The highest mean sodium content per serving was observed in *kebab* (1673 mg) and the lowest in fried potatoes (347 mg), corresponding to 83.6% and 17.4% of the recommended maximum daily intake, respectively.

The mean potassium content per serving was highest in *kebab* (858 mg) and lowest in pizza (164 mg), corresponding to 24.4% and 4.7% of the recommended minimum daily intake, respectively.

The contents of TFA, sodium and potassium in the 29 most commonly available foods collected in Chişinău are shown in Table 8.

**Table 8. trans-fatty acid, sodium and potassium contents of food samples in Chişinău, Republic of Moldova**

Type of vending site	No. of samples	Mean serving size (g)	trans-fatty acids			Sodium			Potassium		
			Mean (range) g/serving	Proportion of recommended level* (%)	Mean (range) mg/serving	Proportion of recommended level* (%)	Mean (range) mg/serving	Proportion of recommended level* (%)			
<b>Street food vending sites</b>											
<i>Industrial foods</i>											
Chocolate	4	88	0.67 (0.01–2.58)	30.3	2 (0–8)	0.1	216 (135–298)	6.1			
Biscuits	4	33	0.21 (0.09–0.45)	9.6	57 (51–63)	2.8	55 (31–68)	1.6			
Ice cream	4	56	0.42 (0.01–0.65)	19.2	30 (15–46)	1.5	80 (67–108)	2.3			
Kvass	4	200	0.04 (0.01–0.06)	1.9	22 (19–28)	1.1	14 (13–15)	0.4			
Pretzels	4	35	0.01 (0.01–0.03)	0.9	285 (135–640)	14.2	57 (45–71)	1.6			
Wafers	4	89	0.53 (0.07–1.88)	24.1	127 (73–188)	6.3	109 (46–162)	3.1			
<i>Homemade foods</i>											
Cheburec	2	117	0.60 (0.04–1.16)	27.2	474 (383–566)	23.7	152 (127–178)	4.3			
Sausage roll	4	125	0.11 (0.06–0.24)	5.2	630 (486–803)	31.5	158 (106–190)	4.5			
Pateuri or pateu	5	129	0.22 (0.11–0.43)	9.9	447 (201–1119)	22.3	175 (32–583)	5.0			
Savoury plăcintă	5	118	1.28 (0.24–2.33)	57.9	528 (338–1029)	26.4	154 (98–198)	4.4			
Sweet roll (chiflă)	4	126	1.45 (0.79–2.72)	65.3	774 (396–1533)	36.7	212 (112–338)	6.0			
Sweet doughnut	4	49	0.11 (0.09–0.15)	5.2	100 (52–146)	5.0	29 (17–38)	0.8			
Sweet plăcintă	4	101	1.01 (0.05–2.02)	45.6	186 (107–357)	9.3	63 (40–115)	1.8			

<b>Supermarkets</b>										
Breakfast cereals	4	36	0.00 (0.00–0.01)	0.1	125 (50–200)	6.2	114 (42–193)	3.2		
Fat spreads, shortening	4	13	0.29 (0.14–0.40)	13.3	1 (0–1)	0.0	6 (2–10)	0.2		
Cakes	3	100	0.96 (0.56–1.16)	43.2	154 (72–197)	7.7	83 (46–123)	2.4		
Crisps	4	20	0.01 (0.01–0.01)	0.7	78 (65–91)	3.9	230 (201–253)	6.5		
Chocolate	4	78	0.28 (0.02–0.83)	12.9	12 (8–17)	0.6	331 (109–484)	9.4		
Dried bread crumbs	3	36	0.01 (0.01–0.01)	0.5	457 (450–463)	22.9	71 (60–78)	2.0		
Industrial bread	4	50	0.00 (0.00–0.00)	0.0	192 (153–240)	9.6	65 (52–82)	1.8		
Noodles (dried)	4	71	0.10 (0.03–0.17)	4.5	1465 (716–2658)	73.2	129 (95–164)	3.7		
Processed meats	4	30	0.11 (0.02–0.21)	5.4	262 (164–405)	13.1	63 (42–89)	1.8		
Savoury pastries	2	147	0.99 (0.99–0.99)	44.7	824 (267–1382)	41.2	145 (81–209)	4.1		
Sweet pastries	3	129	0.26 (0.02–0.64)	12.2	286 (125–404)	14.3	165 (138–208)	4.7		
Wafers	3	89	2.55 (1.74–4.04)	114.8	92 (57–134)	4.6	133 (35–200)	3.8		
<b>Fast-food outlets</b>										
Fried potatoes	4	118	0.12 (0.07–0.22)	5.7	347 (148–664)	17.4	606 (516–696)	17.3		
Hamburgers	4	181	0.64 (0.07–1.08)	29.0	797 (366–1159)	39.8	348 (288–435)	9.9		
<i>Kebab</i>	4	394	0.11 (0.08–0.18)	5.2	1673 (1527–1828)	83.6	858 (660–1150)	24.4		
Pizza	4	97	0.14 (0.08–0.24)	6.5	376 (9–542)	18.8	164 (114–206)	4.7		

\* Proportions of WHO-recommended levels were computed for an average adult with an intake of 2000 kcal. WHO recommended intake: TFA: < 1% total energy value/day (11); sodium: < 2000 mg/day (14); potassium: ≥ 3510 mg/day (16).



## 4. Conclusions and policy implications

This report of a study based on a standardized method provides an overview of the urban food context in Chişinău, Republic of Moldova, with an emphasis on street food. The street food available is abundant. It is sold mainly in and around the central market. Most of the 328 eligible vendors interviewed were women working at a stationary vending site, who were employees. Basic sanitation was accessible to the majority of stationary vendors. The urban food environment in the Republic of Moldova is mixed, with street food vending sites coexisting with small formal supermarkets and fast-food outlets.

Fruit was sold at 2.5% of the vending sites, while foods other than fruit were sold at 80.8% and beverages at 74.3%. The availability of fruit might be underestimated, as vendors who sold only unprepared fresh fruit were not included. Nevertheless, the availability of nutritionally dense foods rich in fibre and potassium such as fruit and vegetables in markets and other sites should be increased.

Of the different types of beverages sold in the street, soft drinks were the most common, being found at over 80% of all vending sites selling beverages. This reflects the increasing influence of western diets and is a concern, given the high sugar content of soft drinks, which is one of the main sources of added sugar in the diet, as observed in other countries (28) and is a probable source of excess energy intake and weight gain. WHO recommends a reduced intake of free sugars throughout the life-course (28). Alcoholic drinks accounted for approximately 40% of all drinks sold at sites selling beverages, which is an additional source of concern, given the high alcohol consumption in the country and its strong association with the burden of NCDs (29,30).

Industrial foods other than fruits were more commonly available than homemade foods. Chocolate, biscuits, wafers and ice-cream were commonly found. Homemade savoury or sweet pastries that are frequently fried were also well represented, and high values for TFA and sodium were found in these pastries: one serving accounted for nearly 60% of the recommended maximum daily level of TFA and more than one third of that for sodium. High levels of sodium were found even in “sweet” foods, which would not be expected. Street food vendors should be made aware of the high concentrations of salt in ready-made industrial products, the harm associated with excess salt in food preparation and the importance of choosing healthy fats.

The most popular products bought in supermarkets were a variety of processed and ultra-processed goods. Savoury pastries, cakes and especially wafers had high contents of TFA per serving, and the highest levels of sodium per serving were found in dried noodles, savoury pastries and dried bread crumbs. The fast foods analysed had particularly high sodium contents: one serving of some foods provided 80% of the recommended maximum daily sodium intake.

The results of this study provide some insight into the influence of the nutrition transition on the cultural and gastronomic heritage of the Republic of Moldova, resulting in the emergence of a more westernized way of eating, in which pastries, snacks, cakes and biscuits predominate. This is a concern, as some segments of the population eat these foods regularly throughout the day, which may result in excess intake of nutrients that are clearly harmful for their health. Promotion of a healthy diet should therefore be a priority, and relevant activities should be integrated into wider work on food security and nutrition in the country. TFA and salt could be strategic starting points.

Various practical policies can be used to promote a healthier urban food environment, and they should be incorporated into existing processes. Such activities are already addressed in national programmes for the prevention of NCDs, such as the national food and nutrition programme for 2014–2020, including provisions to eliminate TFA, regulate the salt and sodium content of food, revise the taxation and price policy to increase the availability of fruits and vegetables and decrease the consumption energy-dense, nutrient-poor foods and beverages. Efforts should be made to improve implementation of these provisions through strong health leadership and an intersectoral approach to strengthen the promotion of healthy diets and the prevention of obesity.

The Government could start by defining salt reduction targets for industrially produced ready-to-eat foods (e.g. savoury snacks and processed ready-to-eat meals as noodles). Maximum limits could be set by regulation, as has been done in many countries, including Finland, Greece and Turkey, and most comprehensively in Argentina and South Africa (31). The limits would apply to all foods available on the market, including in supermarkets and fast-food outlets.

Some countries have adopted regulations to limit the TFA content of fats and oils. Countries in the European Union, such as Austria, Denmark and Hungary, as well as Switzerland, have established maximum limits, and countries in the Eurasian Economic Union have agreed to a regulation prohibiting a TFA content  $\geq 2$  g/100 g in food products by 2018. By defining this limit, they are committed to take steps to limit the availability and use of TFA in food products. Denmark, which introduced a ban on TFA in food in 2003, provides a good example of monitoring to ensure compliance with the legislation (32). To ensure compliance, the Government might consider measures targeted to processors, manufacturers and vendors to encourage them to change to healthier oils (e.g. in frying or in pastry preparation). Street vendors and small-scale manufacturers are very price conscious, given the nominal profit they make, and their choice of cooking fat is likely to be influenced by the price. Increasing the availability and affordability of healthier oils for use by street vendors and manufacturers could significantly change dietary intake, as seen in other contexts (33). For example, the “Healthier Hawker” programme in Singapore improved the availability of and access to healthier oils by bulk purchasing and improving the logistics of supply to street vendors. This in return reduced the price and encouraged vendors to change to healthier vegetable oils (33). The Ministry of Agriculture will play an important role in supporting health goals.

A further action will be to improve the nutritional information on packaged foods, ensuring that all products bear a declaration of nutrients (including sodium) in addition to a list of ingredients. In the Republic of Moldova, a draft law on providing information to consumers, including nutrition facts and front-of-pack labelling aligned with European Union legislation, has been adopted by Parliament on the first reading.

Adoption and enforcement of such policies require Government leadership and also regular monitoring. For both elimination of TFA and salt reduction, a first step will be to map local food suppliers (e.g. manufacturers of oils and fats used in freshly prepared products, wholesale producers, manufacturers of breads, pastries and confectionery, savoury snacks, drinks and processed meats) and to engage them in making healthier products. Mapping was conducted in India, for example, and the producers explored the barriers and opportunities for reducing the use of TFA in order to comply with Government policy (34). Consideration of international food suppliers will also be important. For example, the nutritional composition of foods could be discussed within the Eurasian Economic Union. Monitoring compliance with regulations and providing guidance are also important. For regular monitoring, the Government should assess the capacity of the national public health institutions for analysing foods for TFA and sodium and building the nutritional surveillance system. Together, these activities would contribute significantly to the promotion of healthy diets and the prevention of NCDs in the country. Existing national policies on NCDs and nutrition are excellent entry points for such strategies and would ensure multisectoral action, given the large number of ministries and agencies already involved in implementing these policies.

This study shows that there is considerable room for improvement with regard to the nutritional composition of ready-to-eat foods and drinks sold in Chişinău. Policies are needed to improve the nutritional quality of street food, while protecting its cultural and community role, to prevent diet-related NCDs and address other forms of malnutrition. Regulating salt and TFA content, promoting access to safe, affordable, healthy street foods and regular monitoring are imperative for addressing NCDs and associated health disparities in the urban environment.

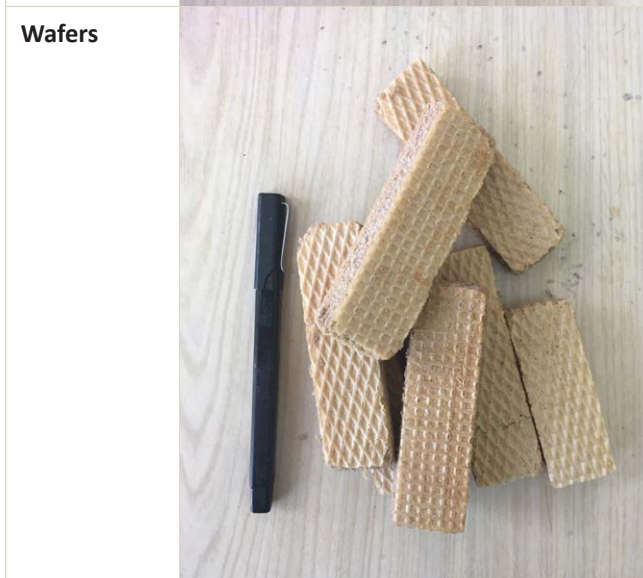
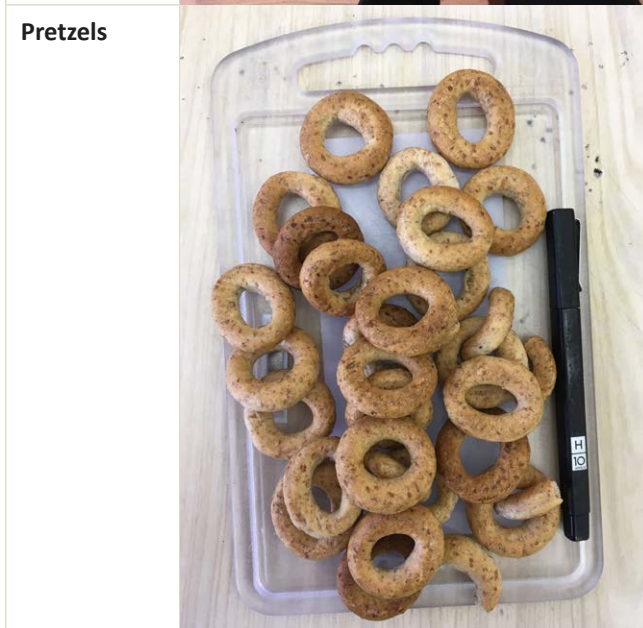
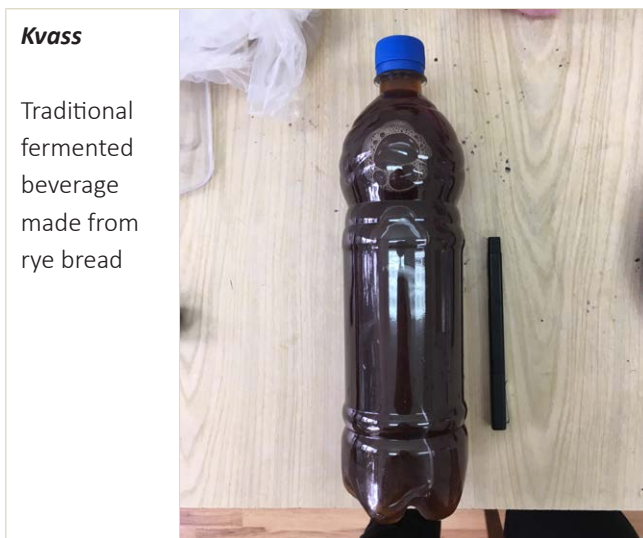
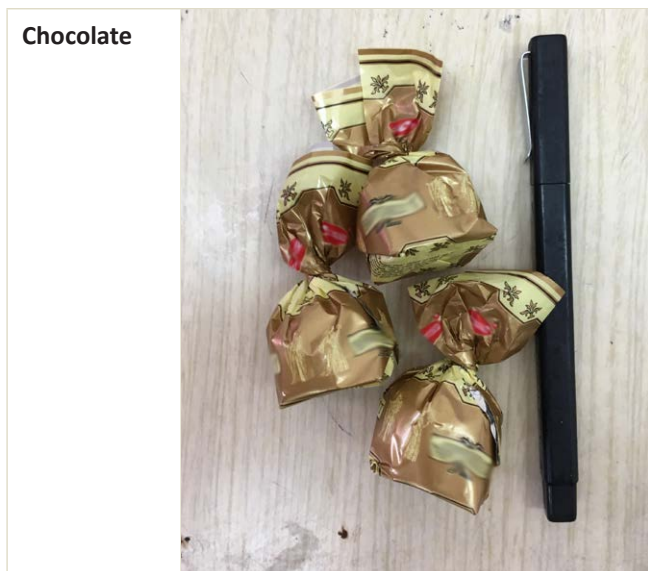
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## Annex 1.

Examples of industrial foods collected at street food vending sites in Chişinău



## Annex 2.

### Examples of homemade foods collected at street food vending sites in Chişinău

<p><b>Cheburec</b></p> <p>Traditional fried savoury pastry generally filled with meat (e.g. chicken, beef).</p>		<p><b>Pateuri or pateu</b></p> <p>Traditional fried pastry made from leavened dough filled with cheese, vegetables or meat, usually an oval shape and served in individual portions</p>	
<p><b>Sweet roll (chiflă)</b></p> <p>Sweet bun made of leavened dough (either flaky or brioche type), usually filled with a sweet filling such as chocolate, vanilla or cherry cream.</p>		<p><b>Plăcintă (savoury)</b></p> <p>Fried pastry, usually made from dough made of flour, water and sunflower oil, filled with cheese, vegetables, meat or potatoes or sweet fillings, usually served in a pie shape, but may have various shapes</p>	
<p><b>Sausage roll or hot dog</b></p>			

**Plăcintă  
(sweet)**

Fried pastry, usually made from flour, water and sunflower oil, filled with a sweet filling as chocolate, vanilla or cherry cream.

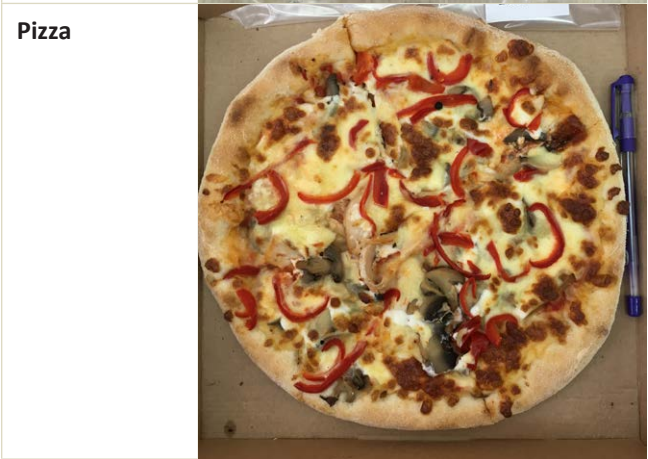


**Sweet  
doughnut**



# Annex 3.

Example of fast foods collected from outlets in Chişinău





## The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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