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**Working Paper**

## Sources and utilization of foodstuffs in Belarusian households: results of the Grodno households survey

Discussion Paper, No. 93

**Provided in Cooperation with:**

Leibniz Institute of Agricultural Development in Transition Economies (IAMO), Halle (Saale)

*Suggested Citation:* Schmitz, Susanne; Brosig, Stephan; Degtiarevich, Josif J.; Degtiarevich, Irina J.; Grings, Michael (2006) : Sources and utilization of foodstuffs in Belarusian households: results of the Grodno households survey, Discussion Paper, No. 93, Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO), Halle (Saale), <https://nbn-resolving.de/urn:nbn:de:gbv:3:2-713>

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## **DISCUSSION PAPER**

**Leibniz Institute of Agricultural Development  
in Central and Eastern Europe**

**SOURCES AND UTILIZATION OF FOODSTUFFS IN  
BELARUSIAN HOUSEHOLDS: RESULTS OF THE  
GRODNO HOUSEHOLDS SURVEY**

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**DISCUSSION PAPER No. 93  
2006**



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### Abstract

The paper is a documentation of a (non-representative) survey on the food situation of households in the Grodno region, Belarus. It covers the year between September 2000 and August 2001. The focus of the survey was on the sources of food in the households (purchase, own production, and receipt in non-monetary transactions between households) and on the utilization (consumption, feed use, sale, unpaid transfers to other households, and spoilage). The paper describes the survey design and the scope and quality of the compiled data set and it presents results of descriptive analyses. The survey households consume a well balanced diet based on potatoes and vegetables as the main staple food. 75 percent of the households use small land plots for food production and a third of the households keep livestock. Household food production provides an important contribution to food available in the households and the value of the produce represents a considerable part of average household income. Most of the self-produced food is consumed or given away in non-monetary transactions. Prices of foodstuffs differ in part significantly between different points of sale and between rural and urban areas.

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JEL: R20, I30

Keywords: Belarus, Grodno, foodstuffs, food, nutrition, diet, household survey.

### ZUSAMMENFASSUNG

#### URSPRUNG UND VERWENDUNG VON NAHRUNGSMITTELN IN WEIßRUSSISCHEN PRIVATHAUSHALTEN: ERGEBNISSE DES "GRODNO HOUSEHOLD SURVEY"

Dieses Diskussionspapier dokumentiert eine (nicht-repräsentative) Befragung über die Ernährungssituation von Haushalten in der Region Grodno in Weißrussland. Die Befragung wurde zwischen September 2000 und August 2001 durchgeführt. Der Fragebogen behandelt vorwiegend das Aufkommen von Nahrungsmitteln aus verschiedenen Quellen (Kauf, Eigenproduktion und den Erhalt von Nahrungsmitteln durch nicht-monetären Transfer zwischen Haushalten) und die Verwendung (Verzehr, Verfütterung, Verkauf, nicht-monetäre Vergabe und Verderb). Das Papier beschreibt das Studiendesign sowie den Umfang und die Qualität der erhobenen Daten. Weiterhin werden die Ergebnisse deskriptiver Analysen präsentiert. Die Ernährung der befragten Haushalte basiert auf Kartoffeln und Gemüse, wobei Kartoffeln das wichtigste Grundnahrungsmittel darstellen. 75 % der Haushalte nutzen kleine Landflächen zur Nahrungsmittelproduktion und ein Drittel hält Nutztiere. Die Eigenproduktion in den Haushalten leistet einen wichtigen Beitrag zum Nahrungsmittelaufkommen und der Produktionswert repräsentiert einen bedeutsamen Teil des durchschnittlichen Haushaltseinkommens. Der größte Teil der produzierten Nahrungsmittel wird verzehrt, gefolgt von der Vergabe in nicht-monetären Transaktionen. Die Nahrungsmittelpreise unterscheiden sich teilweise signifikant zwischen verschiedenen Einkaufsquellen und zwischen städtischen und ländlichen Gebieten.

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JEL: R20, I30

Schlüsselwörter: Weißrussland, Belarus, Grodno, Ernährung, Nahrungsmittel, Haushaltsbefragung.



## CONTENTS

<b>Abstract</b> .....	<b>3</b>
<b>Zusammenfassung</b> .....	<b>3</b>
List of tables.....	6
List of figures.....	6
List of abbreviations.....	7
<b>1 Introduction</b> .....	<b>9</b>
<b>2 The data: Collection, processing, and description</b> .....	<b>10</b>
2.1 Survey implementation .....	10
2.2 Data processing, data quality .....	11
2.3 Sociodemographic structure of the sample .....	12
<b>3 Availability of food in the survey households</b> .....	<b>13</b>
3.1 Content and limitations of the survey .....	13
3.2 Value and composition of food available.....	16
3.3 Relevance of sources of food.....	18
3.3.1 Purchase, production and non-monetary transfers.....	18
3.3.2 Sources of purchased food.....	21
3.4 Non-monetary transfers.....	23
3.5 Distribution of average prices .....	23
<b>4 Food production: Descriptive analysis</b> .....	<b>27</b>
4.1 Factor and input use for household food production .....	28
4.1.1 Land.....	28
4.1.2 Livestock.....	29
4.1.3 Family labour.....	30
4.1.4 Mechanisation and use of agricultural inputs .....	31
4.2 The output: Level, composition, utilization .....	32
<b>5 Conclusions and further tasks</b> .....	<b>35</b>
<b>References</b> .....	<b>36</b>
<b>Appendix</b> .....	<b>38</b>
A1: Questionnaire .....	38
A2: Tables reporting results of descriptive data analyses .....	43

**LIST OF TABLES**

Table 2.1:	Sociodemographic structure of the Grodno household sample .....	12
Table 3.1:	Number of observations on sources and utilization of food .....	14
Table 3.2:	Comparison of per-capita consumption quantities .....	17
Table 3.3:	Shares of different sources in total quantity available for selected foodstuffs .....	21
Table 3.4:	Shares of different sources in purchased food (quantity) .....	22
Table 3.5:	Non-monetary transfers .....	23
Table 3.6:	Comparison of computed average prices (unit values) with official statistics .....	25
Table 3.7:	Differences between prices by settlement type .....	26
Table 3.8:	Differences between prices by point of sale .....	27
Table 4.1:	Land used by households for food production .....	28
Table 4.2:	Livestock tenure by rural and urban households .....	30
Table 4.3:	Input of family labour .....	30
Table 4.4:	Value of food produced per household and year by settlement type.....	32
Table 4.5:	Household food production – Selected food utilization categories in relation to household food production.....	34
Table 4.6:	Household food production – Shares of food product groups in selected utilization categories.....	35

**LIST OF FIGURES**

Figure 3.1:	Sources and utilization of food in private households.....	13
Figure 3.2:	Approximate per-capita consumption of pork.....	15
Figure 3.3:	Share of food types in monetary value of per-capita consumption .....	18
Figure 3.4:	Shares of different sources in the total value of food available to households .....	19
Figure 3.5:	Shares of different sources in the total value of vegetables and fruit available.....	19
Figure 3.6:	Shares of different sources in the total value of dairy products available.....	20
Figure 3.7:	Shares of different sources in the total value of meat products available.....	20
Figure 3.8:	Shares of different sources in the total value of potatoes available .....	20
Figure 3.9:	Shares of product groups in households' total food expenditure .....	21
Figure 4.1:	Distribution of plot sizes among food producing households .....	29
Figure 4.2:	Seasonal pattern of family labour devoted to household food production.....	31
Figure 4.3:	Composition of the total value of household food production .....	33

**LIST OF ABBREVIATIONS**

BYR	Belarusian Roubles
CIS	Commonwealth of Independent States
EUR	Euro
FRG	Federal Republic of Germany
GHS	Grodno Household Survey
GNP	Gross National Product
GSAU	Grodno State Agrarian University
NMT	Non-Monetary Transfers
thsd.	thousand





## 1 INTRODUCTION<sup>1</sup>

According to data collected by the World Bank (WORLD BANK, 2003), in 2002 the Belarusian Gross National Income per head, converted in US-Dollars both in current exchange rates and in purchasing power parities, was the second highest of the European CIS countries after Russia. Nevertheless, the share of food in consumer expenditure, which in 2002 amounted to 52,8 %, was still rather high as compared to Western European countries, although it fell from 61,6 % in 1995 (MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2003a, p. 172). It is not surprising, therefore, that agricultural economists in Belarus pay considerable attention to the topic of food security, although it is mainly the aspect of macro economic self-sufficiency in food, which is being discussed. Thus, ILYINA and MIROCHITSKAYA (2001, p. 73) in their analysis of food security in Belarus come to the conclusion that the situation is not satisfactory though not critical.

An important indicator supporting the view of a large discrepancy between Belarus and most Western European countries in terms of food security is the considerable role of household food production for the supply of food in private households. According to official numbers (MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2003a, p. 175) in 2002 the average share of food produced in households ("food grown in land plots") in total consumption of food amounted to 80,3 % for potatoes, 66,6 % for vegetables and melons, 48,8 % for fruit and berries, 36,0 % for eggs, and 24,2 % for milk. For most products, the numbers indicated for rural households are still considerably higher. Food production in private households is an important income supplement for households. According to official household surveys, household food production ("доход от личного подсобного хозяйства") on average contributes 10,1 % to household income, 6,5 % in urban and 19,2 % in rural households (MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2004, pp. 58 and 63).

Although the household surveys conducted by the Ministry of Statistics and Analysis of the Republic of Belarus give some details about food consumption and expenditures for food in Belarusian households even by region, household composition, expenditure level etc., there seems to be a lack of systematic and detailed analytical studies on the households' food situation. In particular, as to our knowledge, quantitative analyses focussing on the implications of household food production and transfers on the nutrition situation are not available. Multiple studies have addressed the role of household food production (also referred to as subsistence or semi-subsistence agriculture) in transition and developing countries. This role will to a large extent depend on the behaviour of subsistence farmers and this in return on their motivations and objectives. With respect to transition countries these are debated controversially. While some authors – we mention the study by the SEETH et al. (1998) – emphasise its effect to supplement household incomes in times of economic hardship, others (c.f. CLARKE et al. 2000) find that the impact on net household income is oftentimes negative. Their conclusion, supported by interviews in Russian cities, is that households produce basic foods to have a security stock for times of shortages which are still present in the collective memory. KOSTOV and LINGARD (2004) focus on transition countries and argue that subsistence agriculture can play a stabilising role and have beneficial impacts on the agricultural sector but emphasise that there is urgent need for more research into the motivation, objectives and behaviour of subsistence farmers. The amount of open and relevant research questions, particularly the lack of knowledge

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<sup>1</sup> Michael Grings gratefully acknowledges generous logistic support and hospitality of the Grodno State Agrarian University during several research stays in Grodno, and financial support by the Ministry of Education and Cultural Affairs of Saxony-Anhalt, Germany. The authors wish to thank Jörg Gersonde for his helpful contribution to data processing.

regarding the subsistence sector in the Republic of Belarus motivated to initiate a research program on the food situation of Belarusian households. It is supposed to study household behaviour with regard to production, and utilisation of food, which has impacts on agricultural and economic development and determines the effects of government policies on household welfare. For the envisaged type of microeconomic models household level data on production, input use, consumption, sales, unpaid transfers and household characteristics are necessary. Preliminary analysis of the existing literature and official Statistics revealed such data are not available and a pilot study was launched to collect and analyse household data in the Grodno Region in Belarus. The objective of this paper is to summarize the findings of this pilot study on the food situation in selected Belarusian households. It takes into account not only consumption but also food production and other sources of food availability and utilization.

From September 2000 until August 2001, as a co-operation between agricultural economists from Grodno and Halle, a survey was conducted in Grodno and the Grodno region focusing on food availability and utilization in urban and rural households (subsequently referred to as the "Grodno Household survey" – GHS). For the period of one week in each of the months, 80 households were asked to report the quantity of food available from different sources, consumption as well as utilization of food for other purposes. The intention of the survey was to establish for each household a complete balance of food availability and utilization for the respective weeks. Although, correspondingly, the main emphasis was on collecting data on food quantities, some other items were also included in the survey, e.g. expenditure for food and value of food obtained from various sources and the means of production utilized for producing food in the households.

The survey conducted in Grodno can be characterized as a first explorative study, which does not claim representativeness and which can be seen as a starting point for future research. This characterization seems to be appropriate because it became clear during the process of data compilation that some of the main objectives of the survey, e.g. to establish a complete balance of food availability and utilization, could not be realized due to several limitations and shortcomings of the data collected. Nevertheless, the authors feel that the data are sufficiently informative and interesting as to document them in a summarizing way and to provide some descriptive analyses based on the results of the survey in the present discussion paper.

## **2 THE DATA: COLLECTION, PROCESSING, AND DESCRIPTION**

### **2.1 Survey implementation**

As a first step in the co-operation between German and Belarusian agricultural economists a preliminary version of the questionnaire used in the survey was discussed with several members of the scientific staff of the Grodno State Agrarian University (GSAU). In addition, a pre-test with 10 scientists was conducted at the University. The comments of the scientific staff of GSAU and the experience of the pre-test led to several amendments of the questionnaire.

The final questionnaire consists of five parts (cf. Appendix, Section A1): In a first part, some demographic data of the households and data on food consumption away from home are collected. The second part is devoted to food purchases (quantity and value) from four different types of point of sale. In a third part, data on food supply from sources like gifts, in kind remuneration and barter as well as data on food utilization for the respective purposes are reported. The remaining categories of food supply and utilization like production, collecting, fishing and hunting, changes in stocks, sales and decay are included in a fourth part.

Finally, the topic of the fifth part is the means of production available in the households used in food production.

For the whole project only a small budget was available, consisting basically of financial means for covering the travel expenses for one German researcher, the cost of some office material (mainly paper), and the cost of data processing, i.e. the work needed to transfer data from the paper questionnaires into electronic storage (using Excel), which was done manually in Grodno. Small gifts for the households as a gesture of appreciation of their co-operation were procured as donations from various sources or, to a small extent, bought in Germany and transferred to Grodno.

Given this low-budget framework, the survey design was not aimed to be representative. The questionnaires were distributed selectively among students and teachers of the GSAU. The students were told to hand over the questionnaires to their parents who were asked to answer the questions. Thereby, four groups of households were formed, each group consisting of 80 households: From September 2000 until December 2000, in each month a different household group filled in the questionnaires. In the subsequent months, however, the same household groups were included in the survey, such that the September household group answered the questionnaire also in January 2001 and in May, whereas the October household group did so in February and in June, and so on. Thus, in principle the survey design was such that 960 questionnaires were to be filled in by 320 households. A considerable number of households rejected to report in the second and third round and were replaced by new households. Moreover, no identification numbers were attached which could have been used to match observations derived from the same household in different months, i.e. to construct a panel data set. We rather interpret the data as a set of twelve independent samples.

Besides non-representativeness, another consequence of the low-budget character of the survey is that no interviewers could be hired to assist the households in answering the questions. The instructions for the households consisted in a letter describing the intentions and the requirements of filling in the questionnaires and in some oral instructions for the students and teachers when they received the questionnaires.

## **2.2 Data processing, data quality**

Since there was no assistance for households in answering the questions, the likelihood of misunderstandings and mistakes was perhaps higher than in surveys conducted with the assistance of interviewers. Another source of possible mistakes was the manual transfer of the data from the questionnaires to computer files. For this reason, the raw data set was 'cleaned' in the following way:

- Invalid numbers have been set to "missing value" (e.g. if units of measurement were ambiguous with respect to quantity, as for example: Yoghurt in 'pieces').
- For four observation points (household-month-combinations) no data are available and five of the Excel sheets contain data exactly identical to those in other sheets. All data from such duplicate questionnaires were deleted. Furthermore, households with a land area of 5 ha or more were excluded from the analysis as 'commercial farms'. Consequently, data from only 944 observation units entered the analysis.
- Missing values were treated as appropriate for the respective variables in the respective context of analysis: For variables indicating quantities of purchase, production, size of land plots, or hours worked in food production they were oftentimes interpreted to be zero and set to zero.

- We regarded variable values very far from the expected value range as outliers and set them as missing. As an example, we removed improbable values on each household member's weekly hours worked in household food production. Values exceeding 60 hours were set to "missing value". The disadvantage that in some cases such a procedure may be unjustified was considered less grave than that of retaining extreme values where they were due to mistakes in data input or wrong transcription.

The sample was not selected by a sampling process that could guarantee representativeness for the Belarusian (or regional) population. Moreover, the affiliation of the respondents with the GSAU was a clear violation of representativeness. Therefore, the finding that the distribution of characteristics like the average household size and the rural-urban ratio was only in part comparable to figures found in official national and regional statistics, is most probably due to the method of sample selection.

### 2.3 Sociodemographic structure of the sample

Since only households of students and staff members of GSAU were included in the sample, this determined the regional distribution of respondents. The vast majority of students and personnel belong to households located in the Grodno region (oblast). The city of Grodno with a population of about 300 thousand inhabitants is the largest settlement in this area; other major cities are Lida and Slonim with a population of about 100 thousand and 50 thousand inhabitants, respectively. The total population of the Grodno region amounts to approximately 1.2 million (GRODNO REGIONAL ADMINISTRATION OF STATISTICS, 1999). Considering towns with a population of less than 50 thousand inhabitants as rural settlements, about 38 % of the population of the region live in urban and 62 % in rural settlements.

As is obvious from Table 2.1, the *households* in the sample in terms of settlement type follow the opposite distribution: 62 % of the households were located in urban areas, most of them in the city of Grodno. In addition, Table 2.1 gives the basic information about sample households according to household size. Since the average size of households is smaller in urban households (3.8 members, 1.8 of which are children) than in rural households, the share of urban *population* in the sample is slightly lower (59 %) than their share in urban households.

**Table 2.1: Sociodemographic structure of the Grodno household sample**

	Share of households	Average number of household members (children)	Share of persons
Rural	38 %	4.2 (1.8)	41 %
Urban	62 %	3.8 (2.1)	59 %
Total sample	100 %	3.9 (1.9)	100 %

Source: Own computations based on GHS.

A characteristic feature of households in many post-Soviet societies is the considerable incidence of food production in rural and urban households, which cannot be considered agricultural households in a strict sense. In the GHS three quarters of the respondents indicated that their households used land plots for food production and a third of the households kept some livestock. Since we do not have access to comprehensive official statistics on household food production in Belarus, we cannot make conclusions regarding the representativeness of these figures. With regard to the GHS it will be outlined in Chapters 3 and 4 how significant food

production is i) for household food supply, ii) as a source of in-kind (and cash) income and iii) with respect to time and capital that households devote to this activity.

### 3 AVAILABILITY OF FOOD IN THE SURVEY HOUSEHOLDS

In this chapter the composition and the sources of food consumed by the GHS households as well as the arising expenses will be analysed. In some areas, urban and rural households will be examined separately to stress differences. In the last section some comparisons of average prices will be conducted.

#### 3.1 Content and limitations of the survey

In the questionnaire, respondents were asked about different sources of food available to the households. First, there is purchase of food in four different types of point of sale: In shops, at the local market, at kiosks or from other sources (e.g. from neighbours). Second, there is the production by the households themselves including hunting, fishing and collecting (e.g. berries). Furthermore, there is the possibility to receive food as a wage payment in kind, as a gift or in barter deals, which will subsequently be termed ‘non-monetary transfers’ (NMT), and finally there is the possibility to take food from stocks. The respondents were also asked to give information about the utilization of food in their household. Food can be consumed, used as animal feed or sold. Some food is lost due to spoilage. Moreover, there is the possibility to give food away as wage payment in kind, as a gift or in barter deals or to increase stocks. To get a general idea of the sources and ways of utilization of food in private households see Figure 3.1.

**Figure 3.1: Sources and utilization of food in private households**

Sources	Utilization
purchase	animal feed
production	sale
received as gift	transferred as gift
received as wage	transferred as wage
received in barter	transferred in barter
taken from stocks	spoilage
	added to stocks
	consumption

It is not possible to conclude exactly from the data, which amount of the food available was actually consumed, because the records on consumption are only fragmentary. The respective question in the questionnaire has obviously been misunderstood by many households who were misled by the position of that question in the questionnaire. It was asked directly after the question concerning food taken from stocks. Most of the households obviously only indicated which part of the food taken from stocks was consumed in the observation period. Consumption of food from other sources, like purchases, were not included. Therefore, the records about consumption are not sufficiently reliable.

Instead, we tried to approximate consumption quantities as residuals from other information in the GHS data: Consumption of a specific food item or group was computed as the sum of available amounts from all sources minus the sum of all recorded utilizations except consumption. This seems to be an acceptable approach although data on several of these components are obviously relatively incomplete. Altogether, the data on the availability side of the balance

appear far more complete than those on the utilization side. The total number of records containing quantities of food available (like e.g. purchases or production in the household) is 21136 while there are only 2346 such records on the utilization side of the balance. Table 3.1 shows that on the utilization side (animal feed, sale, storage and spoilage) more than 50 percent of the records are incomplete: The households gave the information, that they used food for the respective purpose, but they did not indicate the quantity. These records are to some extent informative regarding the incidence of phenomena like feed use, sale, etc, but they were excluded from further calculations such as for computing means. If in contrast there is no information on the incidence, i.e., the household left the respective field in the questionnaire blank, then the quantity (and value) of the respective item is assumed to be zero and included in the computation of means. The systematic deletion of unknown-quantity-records may however infer a bias in the estimation of the mean unless the unknown quantities are distributed in the same way as all other quantities. One clear reason to reject this assumption is that among the unknown-quantity-records we cannot expect zero-quantities which in fact frequently appear in the complete sample. On the other hand, there are no incomplete observations referring to non-monetary transfers and only a single one referring to purchase.

Because of the frequent incidence of incomplete records on storage (nearly 60 percent), it is difficult to make any conclusions based on the data regarding the changes in stocks. Some households may have recorded particularly high quantities of available (= incoming) food, partly due to foodstuffs that they used to build up stocks during the week surveyed while other households may have "imported" particularly small quantities because they could draw on stocks which had been accumulated before the week surveyed. These latter households have only little requirement of additional foodstuffs in their observation week. Regarding the sum over all households, one can assume that storage and removal from stocks balance out. For these reasons, changes in stocks are not taken into consideration in further calculations. About spoilage of foodstuffs the households gave only little information. A possible explanation of this is the relatively high price of foodstuffs in comparison to income. Spoilage would imply a relatively high financial damage for the households, which is a high motivation to avoid spoilage. Another explanation is that it would be embarrassing for the households to reveal this information, given that the survey was not carried out strictly anonymously.

**Table 3.1: Number of observations on sources and utilization of food**

<i>Sources</i>	Complete observations		Observations with undefined quantity	
	N	%	N	%
Purchase	12455	[100,0]	1	
Production	3485	[90,3]	373	[9,7]
Removal from stocks	5200	[92,2]	440	[7,8]
Non-monetary transfers	317	[100,0]	0	
<i>Utilization</i>				
Animal feed	79	[42,5]	107	[57,5]
Sale	45	[45,9]	53	[54,1]
Storage	492	[42,3]	670	[57,7]
Spoilage	26	[33,3]	52	[66,7]
Non-monetary transfers	198	[100,0]	0	

Source: Own computations based on GHS.

Certain amounts of predominantly household-produced food as for example potatoes (compare Section 3.3) are probably also used as animal feed, but the records about the usage of food as animal feed have a share of 57,5 % of undefined quantities. Thus, an overestimation of computed consumption quantities for these products can be expected.

Taking into account these data limitations and omitting the records concerning storage and removal from stocks, it is nevertheless possible to calculate approximate per-capita consumption quantities for each product. Subtracting for every single food product the sum of the quantities used by all households from the sum of the quantities obtained from all sources neglecting the records on consumption, storage and removal from stocks, one gets the approximate consumption quantity per household and week. To get a year's quantity, one has to multiply this result by 52 weeks. This computed quantity has to be divided by the number of persons (household members), covered by the survey (3714). The outcome of this is the approximate per-capita annual consumption quantity. This calculation method is illustrated exemplarily for pork in Figure 3.2.

**Figure 3.2: Approximate per-capita consumption of pork**

purchase:	1958 kg	animal feed:	12 kg
+ production:	2785 kg	+ sale:	28 kg
+ received as gift:	192 kg	+ transferred as gift:	2 kg
+ received as wage:	3 kg	+ transferred as wage:	0 kg
+ received in barter:	2 kg	+ transferred in barter:	0 kg
		+ spoilage:	21 kg
<hr/>		<hr/>	
= availability*:	4940 kg	= utilisation*:	63 kg
4940 kg – 63 kg = 4877 kg (quantity available for consumption*)			
4877 kg / 3714 persons * 52 weeks = 68 kg = <b>Approximate per-capita consumption of pork</b>			
* neglecting changes in stocks			

Source: Own computations based on GHS.

Because of the differences in data density as mentioned before, one can expect unrealistically high consumption quantities per head for some products. These will probably be the case for products, which can also easily be sold or used as animal feed. Per-capita consumption quantities calculated using this method will be discussed in Section 3.2.

To be able to make a statement about prices and monetary values of food from different sources or possible uses we have calculated the average price for each product. The observations on purchase, as well as those on NMT were included in these calculations. The households were asked to estimate monetary values for food received or given away as a gift, as wage or in barter. Most of these statements seemed to be plausible, so they were included in the calculations in addition to purchase data in order to expand the data basis. For each observation containing a quantity statement on the one hand and a value statement on the other hand, the unit value of this single item was computed. In a second step, monthly food price indices



(MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2002, p. 570) were used to eliminate the effects of inflation for each of these calculated prices, such that every single price refers to the price basis of December 2000. To compute average prices separately for all foodstuffs, statements were only considered in computing the mean if the value was within the margin of one standard deviation below respectively three standard deviations above the mean value. With this method, it was possible to eliminate values with an unacceptable far deviation from the mean value ('outliers') with a limited loss of data. The asymmetric limits were chosen so as to obtain acceptable maximum *relative* deviations from the mean. Records with quantity but no value information were assigned imputed values computed as the quantity multiplied by the average price. On the other hand, it was possible to complete observations without quantity information by division of the value by the average price of that product. Regarding food obtained by production in households, by hunting, fishing and collecting, and also regarding food used as animal feed or sold by the households or spoiled food, only quantity data were collected in the questionnaire, so that it was necessary to assign a monetary value to each of these observations using the average price. As an orientation, some information on monetary values is presented in Euro in the following sections. For the calculations an exchange rate of 1 € = 982.5435 BYR for December 2000 was used.<sup>2</sup>

### **3.2 Value and composition of food available**

In this section, the diet of the Grodno area's population will be described. Table 3.2 shows per capita consumption of major food types. As described in Section 3.1, due to the likely underestimation of alternative ways of utilization like feed use, sale, etc. the true values of average per capita consumption may be lower than the estimates presented here but most likely not higher. For better orientation, the consumption data computed from the GHS (column 2) are compared with official figures from Statistical Yearbooks of Belarus and Germany (columns 3 and 4). One can see that most of the computed per-capita consumption quantities have orders of magnitude comparable to the ones from official sources. The calculated consumption quantities per head for all products and product groups are listed in Table A2.1 in the Appendix.

The true per-capita consumption of potatoes is in all probability considerably lower than the computed value because records on sale and use as animal feed must be assumed to be incomplete. This phenomenon can also be the reason for the very high computed quantities for fruit and also meat consumption, which is twice as high as the reference for Belarus.

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<sup>2</sup> United Nations operational rates of exchange, <<http://www.un.org/Depts/treasury/2001.htm>> and Bulletin EU, <<http://europa.eu.int/abc/doc/off/bull/de/200101/p000552.htm#anch0541>>.

**Table 3.2: Comparison of per-capita consumption quantities**

Product group	Grodno survey computed consumption per capita in kg	Belarus 2001 (Stat. Yearbook 2002) per capita in kg	Germany 2001 (Stat. Yearbook 2003) per capita in kg
Grain products	87	105	84
Milk and dairy products	324*	307 <sup>#</sup>	471 <sup>#</sup>
Meat and -products	120	59	91
Fish and -products	15	16 <sup>§</sup>	14
Butter, oil, fat	15	10 <sup>§</sup>	30
Eggs (pcs.)	284	224	223
Potatoes	536	172	70
Vegetables	129	98	94
Fruit	86	31	112
Sugar, pastries	18	18 <sup>§</sup>	

Source: Own computations, MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2002, p. 156; MINISTRY OF CONSUMER'S PROTECTION, NUTRITION, AND AGRICULTURE OF THE FRG, 2003, pp. 191-193; FEDERAL STATISTICAL OFFICE OF THE FRG, 2003, p. 576.

Notes: \* Computed milk equivalents: 1 kg butter = 22,5 kg milk, 1kg cheese = 8,4 kg milk, 1 kg yoghurt and cream = 3 kg milk.

<sup>#</sup> In milk equivalents.

<sup>§</sup> Especially Grodno region 2003 (MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2004, p. 54)

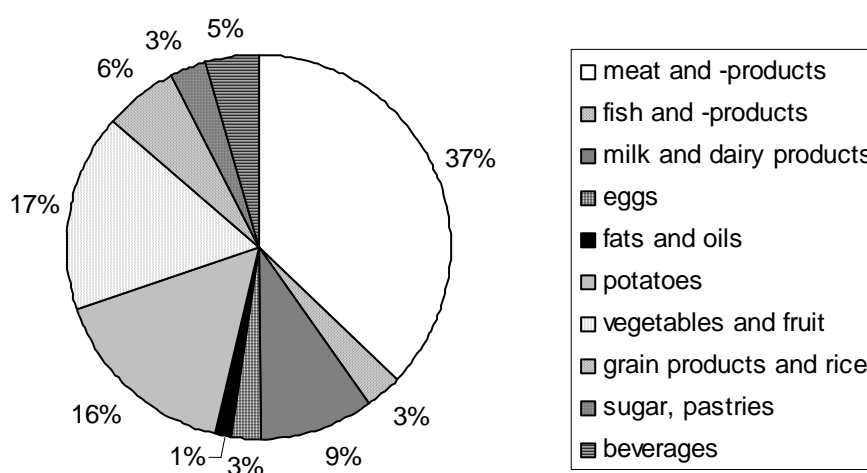
Because of the potentially serious upward bias of the results concerning consumption quantities per head, comparisons between the diets in Belarus and Germany based on the GHS data must be interpreted with care. If one compares the GHS data and official German figures shown in Table 3.2, one can see large differences in the consumption quantities particularly of potatoes, fats and oils as well as fruits. We hence use the official Belarusian data for comparisons with German data in these cases. Fat consumption in Belarus is just one third of that in Germany, fruit consumption just a quarter. In Belarus the amount of potatoes consumed in the year 2001 was more than twice as high as in Germany. Potatoes are by far the most important staple food in Belarus, which can be seen especially in comparison with the consumption quantities of bread (66 kg per head and year), pasta (11 kg per head and year) and rice (4 kg per head and year). These quantities correspond to only six pasta meals and three rice meals per month, if one assumes 150 g pasta and 100 g rice per meal. In Belarus, the consumption of grain products is a little higher than in Germany and the consumption of dairy- and meat products slightly lower. The amounts of fish, eggs and vegetables consumed are nearly equal in both countries.

Considering also those data on per-capita consumption quantities from the GHS, which seem reliable because they are consistent with the official data, one can make further statements. Altogether, the diet of the survey population can be considered a balanced diet based on potatoes and vegetables. In the product group of vegetables, cabbage plays the major role (35 kg per head), followed by cucumbers with 22 kg, tomatoes with 19 kg, onions with 18 kg and carrots with 15 kg per head. Looking at meat, one can see a lower share of poultry and a higher share of pork compared to Germany. In the group of dairy products, Kefir is most popular (26 kg per head). Apples (58 kg) and berries (14 kg) dominate the product group fruit. Fish consumption is quite low as it is also in Germany. This is not optimal as seen from a nutritional

perspective because of the importance of fish for the supply of iodide and omega-3-fatty acids. Altogether, the diet is rich in vitamins (for example cabbage is very rich in vitamin C). Fruits and vegetables are oftentimes obtained from local or regional sources (Section 3.3), so that there are no long transport and storage times necessary and there is only a minimal loss of nutrients.

Considering the share of different product groups in the monetary value of per-capita consumption (Figure 3.3), one can see that meat products are most relevant with 37 %, followed by vegetables and fruits (17 %) and potatoes (16 %). The share of milk and dairy products amounts to 9 %, followed by grain products and rice with 6 %.

**Figure 3.3: Share of food types in monetary value of per-capita consumption**



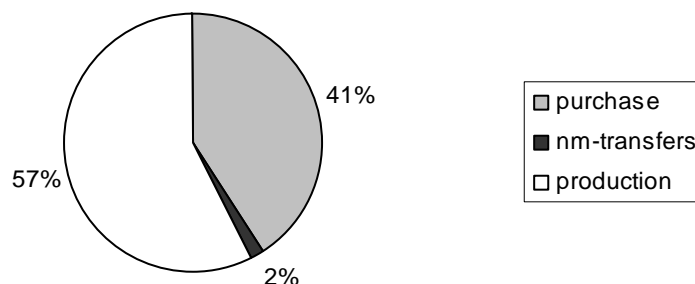
Source: Own computations based on GHS.

### 3.3 Relevance of sources of food

A common feature of the food situation of households in many post Soviet economies is a relatively high relevance of food sources other than purchase. We analyse this aspect in section 3.3.1 and describe the relevance of different points of purchase in section 3.3.2.

#### 3.3.1 Purchase, production and non-monetary transfers

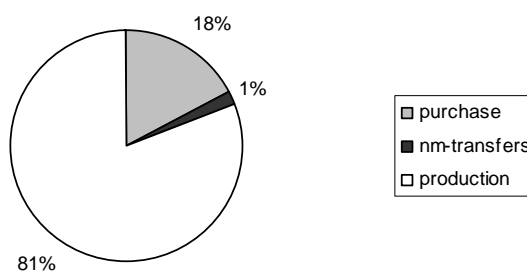
The households in the GHS obtain their food from three major sources, (i) purchase, (ii) non-monetary transfers and (iii) household production including hunting, fishing and collecting. This section deals with the importance of these sources for major food groups in terms of the monetary value of the food and for selected products in terms of quantity shares. Figure 3.4 shows the shares of these sources for the aggregate of the 40 products considered in the survey. The households themselves produce more than half of the value of the available food themselves (57 %) while the value of food received in non-monetary transfers has only little importance (2 %).

**Figure 3.4: Shares of different sources in the total value of food available to households**

Source: Own computations based on GHS.

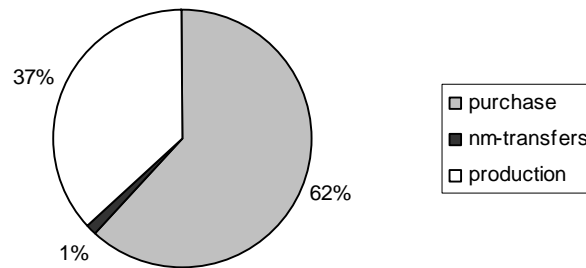
Total expenditure on purchased food per household was 1337 thsd. BYR (1361 €) in the observation year, that is 342 thsd. BYR (349 €) per head and year, and 111 thsd. BYR (113 €) per household and month. Official figures referring to 2001 show a total expenditure on food (including alcoholic beverages) of 1099 thsd. BYR (1119 €) for households with four household members (MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2002, p. 167). Remembering, that an average GHS household consists of 3,9 household members, the calculated value has order of magnitude comparable to the official one. The monetary value of self-produced foodstuffs including hunting, fishing and collection was 1884 thsd. BYR (1917 €) per household (cf. Table A2.3 in the Appendix). The household-produced food on the one hand helps to save money by substituting purchases. On the other hand, it is possible to sell self-produced food and so to increase the monetary income of the household.

As mentioned before, household production (including hunting, fishing and collecting) is the most important source of food for the households surveyed. The following four pie charts illustrate the value shares of the different sources (purchase, production and NMT) for the product groups ‘vegetables and fruit’ (Figure 3.5), ‘dairy products’ (Figure 3.6), ‘meat products’ (Figure 3.7) and ‘potatoes’ (Figure 3.8).

**Figure 3.5: Shares of different sources in the total value of vegetables and fruit available**

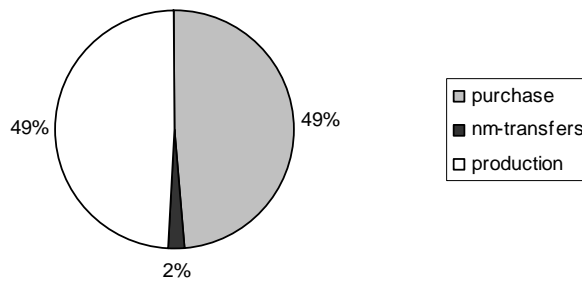
Source: Own computations based on GHS.

**Figure 3.6: Shares of different sources in the total value of dairy products available**



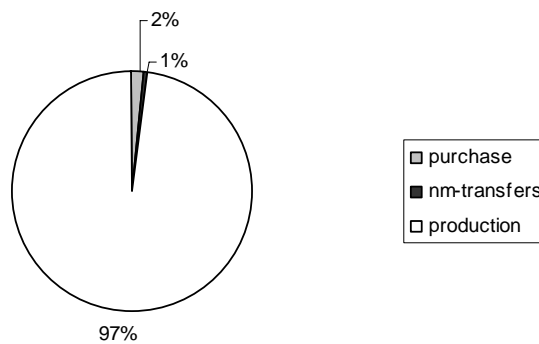
Source: Own computations based on GHS.

**Figure 3.7: Shares of different sources in the total value of meat products available**



Source: Own computations based on GHS.

**Figure 3.8: Shares of different sources in the total value of potatoes available**



Source: Own computations based on GHS.

Virtually all potatoes available (97 % of the total value) are produced by the households, and the respective shares are 81 % of fruit and vegetables, 37 % of dairy products and 49 % of the meat products.

Table 3.3 focuses on products with particularly high shares of household production (over 85 %) or low shares (below 15 %) in the total value of the available amount. One can see that un-processed products like vegetables or potatoes were nearly exclusively produced in the households whereas processed products like beverages, bread and bakery products, yoghurt and sausages were mostly bought. Purchase is also the predominant source for products, which could not be produced in the region, like rice, tea and coffee, or pasta. The non-monetary transfers, additionally mentioned in Table 3.3, will be discussed in Section 3.4. More information about the shares of different sources for individual products is given in Table A2.2 in the Appendix.

**Table 3.3: Shares of different sources in total quantity available for selected foodstuffs**

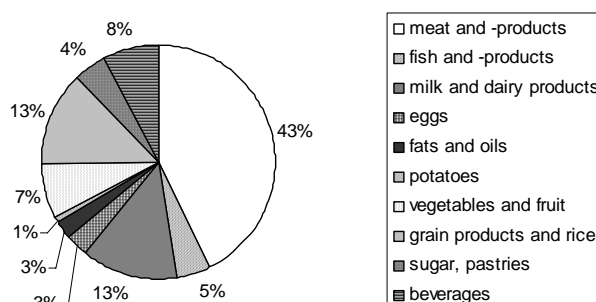
	Production, hunting, fishing, collection, in %	Purchase in %	Received as gift, in barter, as wage, in %
<b>&lt; 15 % household production</b>			
Sausages	9,8	89,4	0,9
Other meat products	7,8	82,6	9,6
Yoghurt and cream	5,1	93,4	1,5
Bread and bakery products	3,6	95,9	0,4
Rice	1,2	98,8	0,0
Pasta	4,8	94,6	0,6
Sugar	10,4	76,8	12,9
Tea and coffee	2,5	96,1	1,4
Alcoholic beverages	10,3	88,7	1,0
Non-alcoholic beverages	11,2	86,7	2,2
<b>&gt; 85 % household production</b>			
Potatoes	96,8	1,9	1,3
Cabbage	85,6	11,8	2,6
Cucumber	87,4	12,6	0,0
Onions	89,1	9,7	1,2
Carrots	86,3	13,0	0,7
Mushrooms	94,1	5,8	0,2

Source: Own computations based on GHS.

### 3.3.2 Sources of purchased food

The households' total expenditure on purchased food is composed as illustrated in Figure 3.9.

**Figure 3.9: Shares of product groups in households' total food expenditure**



Source: Own computations based on GHS.

The largest share in total expenditure is due to the purchase of ‘meat products’ (43 %), followed by ‘grain products’ (13 %) containing bread and bakery products, flour, rice, and pasta, and dairy products (13 %). In addition, one can say that nearly 70 % of the expenditure for ‘meat products’ are devoted to pork (39 %) and sausages (30 %) and 69 % of the costs of ‘grain products’ are caused by expenditure on ‘bread and bakery products’. Next are ‘beverages’ with 8 % and ‘fruits and vegetables’ with 7 %. ‘Beverages’ include coffee, tea, non-alcoholic and alcoholic drinks. Furthermore, there are ‘sugar and pastries’, ‘fish products’, ‘eggs’, and finally with a share of only 1 % ‘potatoes’, which, remembering the high consumption, points out the relevance of the households’ production of potatoes. For further information about the monetary value of the shares of product groups in total expenditure, see Table A2.4, about single products Table A2.3 in the Appendix.

In the questionnaire, the sources of purchased food (points of sale) are divided into four categories: ‘Shop’, ‘market’, ‘kiosk’ and ‘other sources’ (e.g. purchase from neighbours). In this section, we describe the relevance of each source. On average, a household bought food for 814 thsd. BYR (829 €) per year in ‘shops’, for 317 thsd. BYR (322 €) at ‘markets’, for 5 thsd. BYR (5 €) in ‘kiosks’ and for 162 thsd. BYR (164 €) from ‘other sources’ in the observation year. ‘Shops’ are obviously the most important location for food purchases. The amount of money spent on food in shops was more than twice as large as the expenditure on purchases from the other sources together. As one can see in Table 3.4, fresh products like fruits and vegetables were bought more likely at the market whereas especially dairy and bakery products were bought nearly exclusively in shops. This applies also for eggs with a share of shops of nearly 80 %. For meat and meat products shops were the most important source, too, but considering the food categories belonging to this group separately (Table A2.5 in the Appendix), it is remarkable that 59,1 % of pork was purchased from other sources and 73,5 % of mutton at markets. In fact, all the other products of this group were mainly bought in shops, especially highly processed goods like sausages (79,8 %). In addition, other highly processed goods like sugar, pastries and grain products were mainly bought in shops. Of course, the abovementioned dairy products also belong to this group. The purchase at kiosks plays only a minor role altogether. Besides for pork, other sources are also important for mushrooms (62,2 %), berries (46,7 %) and potatoes (30 %). Mushrooms and berries were most likely collected by private persons and directly sold to friends or neighbours, and, partly in street trading although this is not legal in Belarus because quality controls aren’t possible. However, it is necessary to pay a fee for selling products at official markets.

**Table 3.4: Shares of different sources in purchased food (quantity)**

Product group	Shop in %	Market in %	Kiosk in %	Other in %
Meat and meat products	48,4	22,9	0,1	28,6
Fish and fish products	53,9	45,4	0,4	0,3
Milk and dairy products	97,1	2,5	0,1	0,4
Eggs	77,9	18,8	0,3	3,0
Fats and oils	40,8	58,3	0,5	0,3
Potatoes	31,9	38,1	0,0	30,0
Vegetables and fruit	32,4	57,8	0,7	9,1
Grain products and rice	89,0	9,8	0,2	0,9
Sugar and pastries	71,2	27,3	0,8	0,8
Beverages	43,1	55,2	0,9	0,8

Source: Own computations based on GHS.

There is a marked difference between urban and rural households in food expenditure. In the GHS a household located in an urban area consists of 3,8, a rural household of 4,2 persons on average. The average person living in an urban household had a total expenditure of 412 thsd. BYR (419 €) on food per year on average, a person in a rural household of only 230 thsd. BYR (234 €). These are only 56 % of the food expenditure of an urban household member. The explanation is the smaller need of purchased food because of the larger amount produced by rural households (see Section 4.2). The shares of different sources of purchased food in total expenditure differ slightly between rural and urban areas.

### 3.4 Non-monetary transfers

Food can be received and given away by the households as a wage payment in kind, as a gift or in barter deals. These non-monetary transfers are important for the population of the Grodno region. The survey contains information about 492 non-monetary transfers. Therefore, each household was involved in two such activities on average. In Table 3.5 one can see first the number of households involved in each kind of NMTs in their observation period and second the whole number of observations concerning the respective kind of transaction. For example, 121 households have received foodstuffs as a gift and there are 240 statements about gifts received. Each of these households received two different food items on average in their observation week. Actually, to give away and to receive food as a gift is the most important kind of NMT with 379 transfers altogether, followed by food given or received as wage payments in kind with 80 transfers and in barter deals with only 33.

**Table 3.5: Non-monetary transfers**

	Number of households involved	Number of non-monetary transfers	Value of non-monetary transfers per household and year in	
			BYR	€
Received as gift	121	240	47700	48,50
Received as wage	27	43	8100	8,20
Received in barter	19	21	3100	3,20
Given as gift	77	139	13200	13,50
Given as wage	30	37	3000	3,10
Given in barter	11	12	700	0,70

Source: Own computations based on GHS.

### 3.5 Distribution of average prices

In order to check for errors in the data and to assess the appropriateness of the method of price calculation, this section focuses on the average prices (unit values) derived from the GHS and compares them with the corresponding prices from the Statistical Yearbook of Belarus. In addition, differences between GHS-prices by settlement type and different sources of purchased food will be analysed.

For each product an average price for the whole observation period September 2000 to August 2001 was calculated according to the procedure described in Section 3.1, i.e. averaging inflation-adjusted prices with the price basis December 2000.<sup>3</sup> The resulting average price was compared with price information published in the Statistical Yearbook of Belarus (see Table 3.6). However, since the influence of inflation cannot be assumed to be equal for

<sup>3</sup> For information about the average price for individual products see Table A2.6 in the Appendix.



all products, deflating all prices with a common price index for food will inevitably lead to biases. It was considered necessary, therefore, to calculate in addition a summarizing price statistic for each product or product group for a specific month, i.e. averaging only over households.<sup>4</sup> Since the price information given in the Statistical Yearbook of Belarus refers to December of each year, the price information for December 2000 available from the GHS was chosen as a basis for this calculation. It should be noted, however, that the number of observations for this month amounts only to 12 to 76, depending on the specific product.<sup>5</sup>

If one takes the December 2000 prices from the Statistical Yearbook of Belarus as a point of reference (100 %) and compares them with the GHS-prices, most of the computed prices exceed the reference price with the exception of fish and fish products with 97 % of the reference price. 60 % of the calculated prices fall within the range of 100 % and 140 % of the reference prices. This applies for cheese, pork, milk, sausages, eggs, butter, poultry, sugar and pasta. Another 30 % range between 150 % and 190 % of the reference prices, which is the case for rice, apples, flour, bread and bakery products and beef. Extraordinarily high prices were computed for onions (206 %), potatoes (249 %) and cabbage (316 %).

Considering GHS-prices exclusively for December, smaller deviations result. For 72 % of the products the computed prices range between +20 % and -20 % of the reference prices. For 22 % of the product groups the deviation is between 125 % and 160 %, whereas for onions it is extremely high again (198 %). Summarizing, one can say that the order of magnitude of the average prices calculated using only data for December 2000 is closer to the prices published in the Statistical Yearbook of the Republic of Belarus than the prices containing the inflation-adjusted data of the whole observation period.

Compared to German price-income relations, the absolute differences between prices seem very small, considering them in comparison with the income, they become much more important. The higher prices for most of the products found in the GHS may be explained in connection with the relatively high average income in the Grodno region. In richer regions, vendors can achieve higher prices for foodstuffs than in poorer ones because supply is often short and there is only little competition among private vendors. So, one can expect prices above the national average for the food bought by the surveyed households because price fixing does not exist at markets. The same applies to imported goods (mainly from Poland), which were probably more common in the Grodno region during the survey period (before Poland became a member of the EU) than in other regions.

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<sup>4</sup> The elimination of outliers (see Section 3.1) was implemented for the individual samples used for price calculation (the whole-period sample and the December sample).

<sup>5</sup> For information about the average price for December 2000 for individual products see Table A2.7 in the Appendix.

**Table 3.6: Comparison of computed average prices (unit values) with official statistics**

	Average prices for December 2000 according to Stat. Yearbook 2002 per kg		GHS average prices						
			Sep 2000-Aug 2001 per kg			December 2000 per kg			
	BYR	€	BYR	€	in %	BYR	€	obs*	in %
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Fish and fish prod.	1921	(1,96)	1855	(1,89)	97	1733	(1,76)	[35]	90
Cheese	2447	(2,49)	2655	(2,70)	109	2490	(2,53)	[31]	102
Pork	2359	(2,40)	2647	(2,67)	112	2421	(2,46)	[29]	103
Milk (l)	201	(0,20)	237	(0,24)	118	176	(0,18)	[63]	88
Sausages	2762	(2,81)	3239	(3,31)	117	2968	(3,02)	[61]	107
Eggs (10 pieces)	656	(0,67)	777	(0,79)	119	671	(0,68)	[43]	102
Butter	1886	(1,92)	2383	(2,43)	126	2010	(2,05)	[50]	107
Poultry	1728	(1,76)	2187	(2,23)	127	2022	(2,06)	[23]	117
Sugar	571	(0,58)	773	(0,79)	136	685	(0,70)	[37]	120
Pasta	565	(0,58)	787	(0,80)	139	607	(0,62)	[52]	107
Rice	482	(0,49)	721	(0,73)	150	529	(0,54)	[22]	110
Apples	277	(0,28)	418	(0,44)	151	351	(0,36)	[36]	127
Flour	414	(0,42)	647	(0,67)	158	467	(0,48)	[28]	113
Bread,bakery prod.	317	(0,32)	559	(0,57)	176	521	(0,53)	[76]	164
Beef	1501	(1,53)	2726	(2,77)	182	2391	(2,43)	[15]	159
Onions	215	(0,22)	442	(0,45)	206	425	(0,43)	[15]	198
Potatoes	104	(0,11)	257	(0,26)	249	143	(0,15)	[12]	138
Cabbage	91	(0,09)	289	(0,29)	316	94	(0,10)	[13]	103

Source: Own computations, MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2002, p. 567.

Note: \* Number of observations.

In the following section, the differences between the average prices of disaggregated products from different sources of purchased food will be analysed. It was investigated whether the differences between average prices have to be interpreted as stochastic or whether they differ significantly. This was analysed for the differences between prices in rural and urban areas, too. For each product inflation-adjusted average prices (shop, market, urban areas, rural areas) with the price basis December 2000 were calculated.<sup>6</sup> First the Kolmogoroff-Smirnov test was used to check whether the prices of each product in the respective two subsamples follow a Gaussian distribution. Where the data in both subsamples followed a normal distribution, the homogeneity (equality) of variances was tested (F-test). Finally, the corresponding t-test was implemented in order to test for equality of sample means (the pooled t-test for equal variances, the Satterthwaite t-test for unequal). To compare the mean values of two samples without Gaussian distribution, respectively of one sample with and one without, the Wilcoxon rank sum test was used, which is a non-parametric method. A level of significance of 5 % applies to all implemented tests.

<sup>6</sup> The elimination of outliers (see Section 3.1) was implemented for the individual samples used for price calculation (shop, market, urban areas, and rural areas).

Regarding the average prices of products bought in rural in contrast to urban areas, the Kolmogoroff-Smirnov-test showed a Gaussian distribution for 92,5 % of the tested samples. For 9 of 40 products it was necessary to use a non-parametric test (compare Table A2.8 in the Appendix). One can see significantly higher prices in rural areas for 10 of the products (Table 3.7). These were mainly foodstuffs which are rarely purchased in rural areas (eggs, cabbage, carrots, tomatoes, yoghurt, cream and poultry) due to high levels of production of these foodstuffs by the households themselves. On the other hand, this group includes processed staple foods like flour and sugar, but also pasta, tea and coffee. Some of these latter foodstuffs are certainly imported goods, which have to be transported to rural areas. The arising costs of transportation are probably passed down to the final consumer. Furthermore, there is only little business competition in rural areas. In small villages, there is oftentimes only one single shop, which consequently has a monopoly position especially for these imported goods without price fixing. ‘Pastries’ are the sole exception, which sells at a significantly higher price in urban areas. In cities there is more business competition, so that the shops can not achieve trade margins as high as in rural areas.

**Table 3.7: Differences between prices by settlement type\***

Product	Average price in urban areas	Average price in rural areas	
	(BYR/kg)	(BYR/kg)	in % of urban areas
Poultry	2124,8	2400,9	113,0
Yoghurt and cream	1258,9	1398,7	111,1
Eggs (piece)	77,5	84,4	108,9
Tomatoes	877,4	1173,1	133,7
Carrots	353,4	505,7	143,1
Cabbage	259,2	382,8	147,7
Flour	616,6	749,5	121,6
Pasta	742,0	854,9	115,2
Sugar	734,2	838,2	114,2
Tea, coffee	7164,7	7911,6	110,4
Pastries	2583,0	2142,2	82,9

Source: Own computations based on GHS.

Note: \* Price difference significant at 5 % level.

Concerning the distinction between prices in shops and at markets, the Kolmogoroff-Smirnov test shows a Gaussian distribution for 83,8 % of the tested samples. As a result of one sample only containing two observations, the product ‘mutton’ could not be investigated. For ten of the products a non-parametric test had to be used because one or both distributions to be compared were not normal (for further information see Table A2.9 in the Appendix). 12 of the 40 tested products showed significantly higher prices at markets than in shops (Table 3.8). This is predominantly processed food like butter, cheese, fats and oils, sugar, non-alcoholic beverages, coffee, tea, and sausages. Furthermore, to this group belong meat products like pork, bacon, poultry and other meat (e.g. deer meat or rabbits), and eggs. Tomatoes are the sole exception, which sells at a significantly higher price in shops. Since most shops are state-owned, most prices in shops are controlled and fixed at lower levels than on markets.

**Table 3.8: Differences between prices by point of sale\***

Product	Average price in shops		Average price at markets	
	(BYR/kg)		(BYR/kg)	in % of price in shops
Pork	2624,7		2945,0	112,2
Bacon	2380,8		2662,6	111,8
Poultry	2074,4		2437,1	117,5
Other meat	2410,3		2975,7	123,5
Sausages	3238,3		3530,9	109,0
Butter	2379,8		2953,1	124,1
Cheese	2629,4		3905,3	148,5
Eggs (piece)	76,2		98,4	129,1
Fats and oils	1227,4		1402,3	114,2
Tomatoes	1117,0		877,2	78,5
Sugar	723,9		883,7	122,1
Tea, coffee	7201,1		7949,4	110,4
Non-alcoholic beverages (l)	432,3		634,0	146,7

Source: Own computations based on GHS.

Note: \* Price difference significant at 5 % level.

Summarizing, one can say that potatoes and vegetables play a significant role in the diet of the survey households. Potatoes are by far the most common staple food item. Household food production plays an important role; it contributes 57 percent of the value of the food available.

Furthermore, there is a tendency of higher prices for food in rural than in urban areas and higher prices at markets than in shops. Shops are the most frequently used sources for purchased food, markets play a larger role only for fruit and vegetables. Transfers of food between households without payment (non-monetary transfers) are also important for the survey households, especially to receive and to give away food as gifts.

#### 4 FOOD PRODUCTION: DESCRIPTIVE ANALYSIS

Household food production is a widespread phenomenon in post-Soviet economies. According to the Law of Belarus, personal part-time farms of citizens (the 'location' or 'source' of household food production) refer to a form of economic activity of citizens based on use of land which is in private property, in lifelong hereditary possession or transferred in rent for conducting a personal part-time farm.

In total in the Grodno area there are over 300 thousand such facilities. In 2001 they used about 15 % of the total agricultural land area. On national average they produce, according to figures for 2001, almost 37 % of the milk, 26 % of the meat, 91 % of the potatoes, and approximately 87 % of vegetables, berries and fruits (cf. MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2003a).

We focus here on food production activities (*Хозяйства населения*) of households rather than on family farms (*Крестьянские (фермерские) хозяйства*) or farms (*Сельскохозяйственные организации*) in the sense of agricultural statistics (MINISTRY OF STATISTICS AND ANALYSIS OF THE REPUBLIC OF BELARUS, 2003b).

The GHS reflects the extraordinary relevance that household food production has not only in rural but also in urban areas. Three quarters of the respondents indicated that their households use any land plot(s) for producing food and a third of the households keep any livestock for food production.

This section provides insight into the extent, the structure and the significance of these activities. In particular, we focus on the households' factor endowment used for food production and on the level and structure of production as characterised by the use of inputs and the output produced. Finally, the utilization of the output is described.

#### 4.1 Factor and input use for household food production

Factor endowment of personal part-time farms of citizens as a private property comprises farm buildings, livestock, long-term plantings, vehicles and other property. Use of land plots and small scale animal husbandry for household food production have already been popular in Belarus during Soviet times, but became more widespread after independence in 1992.

The following descriptive analysis is based on the GHS. We used 944 (of originally 960) household-month-combinations which were selected as described in section 2.2. For simplicity, we call them 'households' in the sequel.

##### 4.1.1 Land

The land area used by households in food production is characterised in Table 4.1.<sup>7</sup> It shows that particularly in rural settlements, where 88 percent of households use land for food production, this activity is an ubiquitous phenomenon. They typically have one or several pieces of land nearby their residence ('огород', 'ogorod') and/or use a larger piece of agricultural land in connection with large commercial/collective farms (личное подсобное хозяйство в коллективном с/х. предприятии, LPX). The average size of land of these predominantly rural households is 0.2 ha. For urban households, of which still 69 percent grow food products, the most common place to maintain food production is the site of their datcha (дачный участок) outside town. The size of their land is only half of that found in rural households.

**Table 4.1: Land used by households for food production**

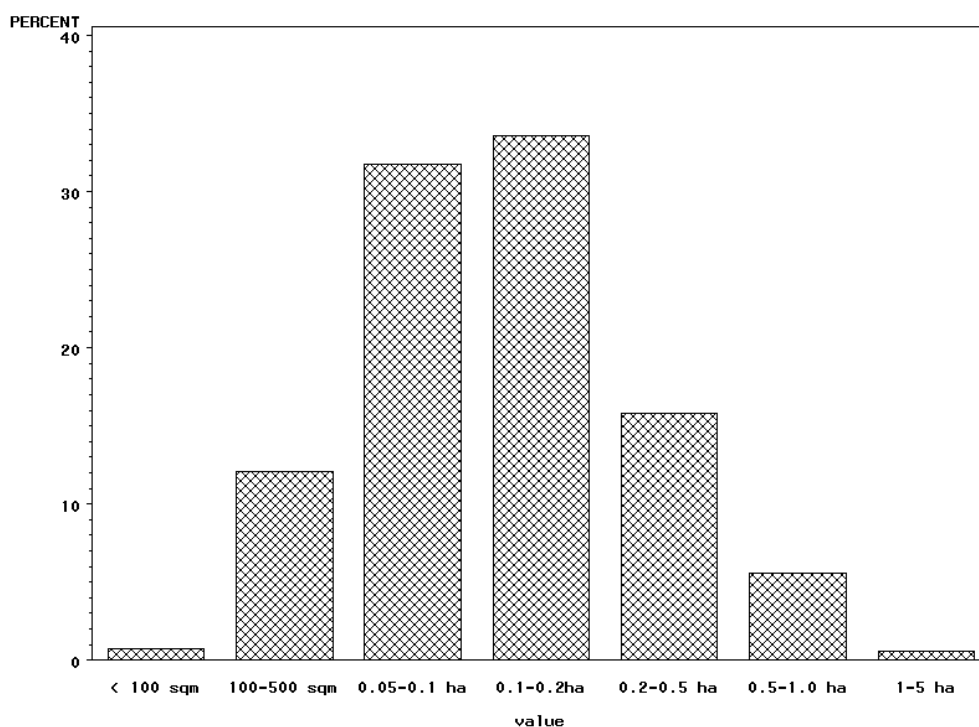
	Rural households	Urban households	All households
Share of households using land plots	88 %	69 %	76 %
Most frequent type	Ogorod (house garden)	Datcha	
Average Size	0.21 ha	0.10 ha	0.15 ha

Source: Own computations based on GHS.

The distribution of (total) plot size is illustrated in Figure 4.1. 65 percent of those households that engage in household food production use land sizes between 5 and 500 ares (0.05 and 0.5 ha).<sup>8</sup>

<sup>7</sup> For detailed figures on land use see Tables A2.10 to A2.13 in the Appendix.

<sup>8</sup> It must be kept in mind that households with land area of 5 ha or more ('commercial farms') were excluded from the analysis.

**Figure 4.1: Distribution of plot sizes among food producing households**

Source: Own computations based on GHS.

Most of the land plots of rural households (74 %) have been used by the household already during Soviet times. Only 60 % of urban households use their land plots since that time while 40 % acquired them after the system change. This development may be seen in the context of the deteriorating economic situation after the country's independence when unemployment grew fast and families started household food production as a strategy to cope with that situation.

#### 4.1.2 Livestock

Animal husbandry is observed in 32 % of the households considered, almost all of which are also engaged in crop production. Table 4.2 gives an overview of the popularity of keeping different species and average herd sizes. More detailed figures on all species covered by the survey can be found in Table A2.14 in the Appendix. The daily attendance required for livestock restricts animal husbandry particularly to those households, which produce food in an 'ogorod' (house garden) nearby their residence. These are mainly rural households, two thirds of which keep any livestock at all. Pigs, poultry (for eggs and meat) as well as milking cows are the most common species. The average number of animals per household (counting only those, which keep animals of the respective species at all) is small compared to what could be expected for market-oriented farms. As an aggregate measure, we use livestock units.<sup>9</sup> Those households engaged in animal husbandry keep on average 1.6 livestock units. The food quantities that can be produced from such stock do not considerably exceed consumption of a family. Regarding urban households, it is still 12 percent that keep any livestock, in particular chicken. The herd sizes of those households are only insignificantly smaller than in the average rural household. On average, urban households keep 0.8 livestock units.

<sup>9</sup> The weights used for computing livestock units are as follows: Cattle: 1.0, pigs, sheep, goat: 0.2, poultry, ducks, rabbits, nutria: 0.02, geese, turkey: 0.03, horse: 0.7.

**Table 4.2: Livestock tenure by rural and urban households**

	Rural households		Urban households		All households	
Share of households keeping ...						
In brackets: Avg. herd size						
Pigs	59 %	[3.0]	8 %	[2.1]	27 %	[2.8]
Poultry	58 %	[15.0]	10 %	[13.0]	28 %	[14.0]
Cows	40 %	[1.2]	2 %	[1.1]	17 %	[1.2]
Rabbits	8 %	[13.0]	1 %	[12.0]	4 %	[13.0]
Livestock units (s. Footn. 9)	65 %	[1.8]	12 %	[0.8]	32 %	[1.6]

Source: Own computations based on GHS.

61 percent of the livestock-keeping households reported to have any building or shed in use for their food production activities. Usually this is a stable, the average size of which is 56 square meters. We assume that among the 39 percent of livestock keepers without any records on stable space many may actually have such facility in use but have just not reported on it in the questionnaire. The same applies for the use of feedstuffs. Only 44 percent of livestock keeping households reported on feedstuffs they were using. The most frequently used feedstuffs were root crops (22 percent of the livestock-keeping households), hay and straw (18 percent) and cereals (17 percent).<sup>10</sup>

### 4.1.3 Family labour

The reporting of the households indicates that food production is usually carried out with considerable input of family labour. The average land using household devoted 32 hours of family labour per week to food production<sup>11</sup>. Table 4.3 shows amounts of labour input per week for different household types. Households keeping livestock spent 51 hours on average on food production activities. The bigger relevance in rural areas of household food production is also reflected in the hours of family labour devoted to that activity.

**Table 4.3: Input of family labour**

	Rural settlements	Urban settlements	All settlement types
Hours per week, average among...			
... households using land plots for food production	47	20	32
... households keeping livestock	54	40	51
... all households	40	14	24

Source: Own computations based on GHS.

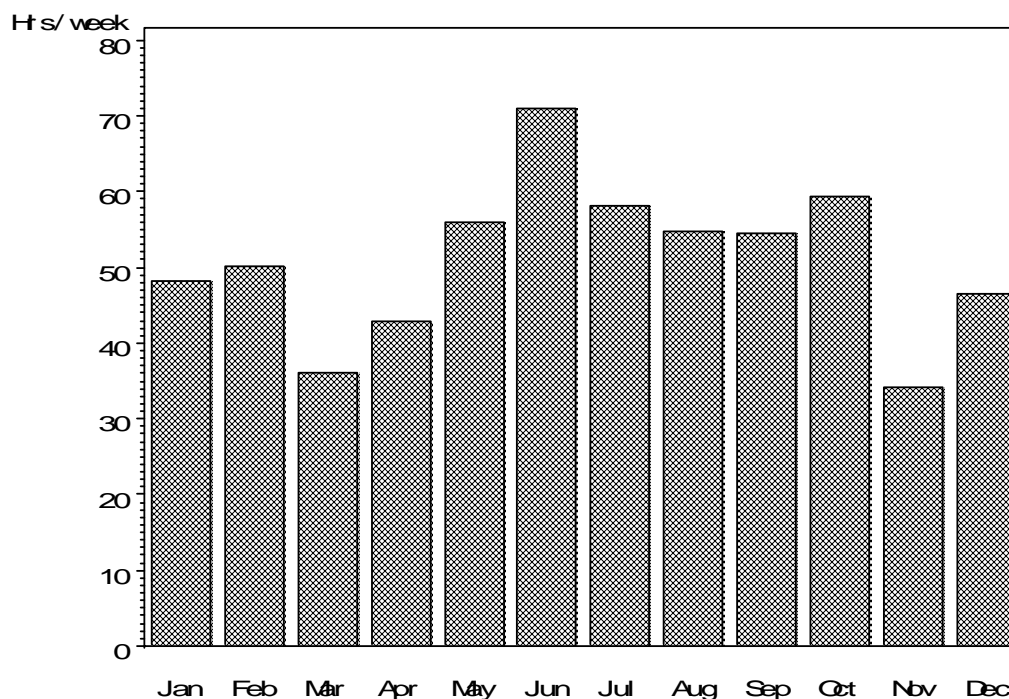
The seasonal pattern of family labour devoted to food production can be seen from Figure 4.2 (avg. among households that use land plots). Although labour input between early summer and early autumn is well above the annual average, the pattern is remarkably smooth for a highly seasonal sector as agriculture. On the one hand, production is obviously diversified enough with various kinds of crops (and livestock) to imply a relatively balanced labour input

<sup>10</sup> For detailed information see Table A2.15 in the Appendix.

<sup>11</sup> The period that the households were asked to record their labour input for is one week. This relatively short period makes over-reporting due to border effects more likely than under-reporting due to memory losses: Households may have included labour input that was actually before the reported week.

demand over the year. On the other hand, it is common practice that families get external help during peak seasons, particularly from relatives, e.g. for harvest. This limits the necessary family labour input during seasons of high labour demand.

**Figure 4.2: Seasonal pattern of family labour devoted to household food production**



Source: Own computations based on GHS.

#### 4.1.4 Mechanisation and use of agricultural inputs<sup>12</sup>

Only few of the households in the GHS reported to possess and/or use any machinery exclusively or in part for their food production activities. Considering that 99 percent of the households cultivate plots of less than one hectare it is remarkable that 4.3 percent of them have their own tractor in use. Lorries and other machines are used by 0.9 and 1.0 percent of the households respectively. Private cars or motorcycles are oftentimes important for food production, particularly for urban households as a means to commute between the residence and the datcha site and to transport produce and inputs. 9.2 percent of the households considered own a car or motorcycle.

In 9 percent of the questionnaires, there are records on fertiliser use. Almost all of these households use organic fertiliser, 1.4 percent of households report to use mineral fertiliser. It can be assumed that a considerably larger percentage of crop producing households use fertiliser, at least manure from their own livestock. It matches casual observation that the use of mineral fertiliser that has to be purchased is very rare among household plot users.

There is no information on the use of other agrochemicals, i.e. for crop protection or animal health and of services like ploughing.

<sup>12</sup> For detailed information see Tables A2.16 and A2.17 in Section A2 of the Appendix.



## 4.2 The output: Level, composition, utilization

The total value of household food production was computed from the questionnaire information on the quantities produced. The respondents of the GHS reported for 40 specific food products on the sources out of which the household obtained these products during the survey week (purchased, produced, hunted or collected from forest, received for free, taken from own stocks). They also reported on the utilization of food products during that period (consumed, used as feed, added to stocks, sold, given to others for free, spoiled). Our analyses of food production and utilization are based on these records. The price component was computed as average unit values (deflated with December 2000 as the price base) from those records with corresponding quantity and value data that were available, i.e. records on food purchases and on unpaid transfers between households (Tables C and D in the Questionnaire, see Appendix A1). Since each of the resulting data on the value of food production refers to one particular week, they were converted to annual values (multiplication with 365/7). Table 4.4 gives an overview of the average production value per household<sup>13</sup> and shows that large differences between the patterns of rural and of urban households exist. Figure 4.3 visualizes part of these data, i.e. the product groups' value shares. Appendix Table A2.18 lists the values and shares for 40 differentiated products.

**Table 4.4: Value of food produced per household and year by settlement type**

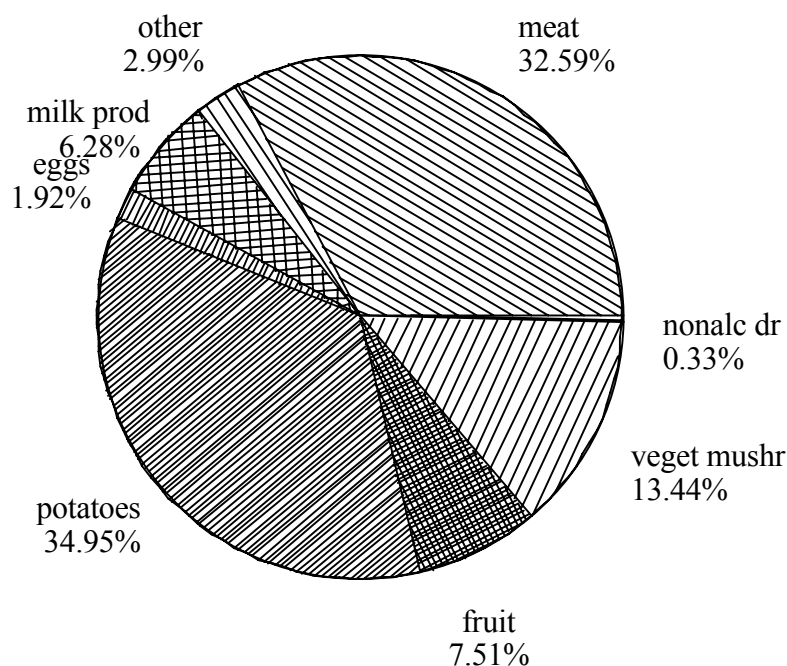
(In 1 000 BYR (at Dec 2000-prices) and % of the value of total production)

	Rural settlements		Urban settlements		All settlement types	
Meat products	1116	(35 %)	232	(25 %)	567	(33 %)
Dairy products	234	(7 %)	30	(3 %)	107	(6 %)
Eggs	62	(2 %)	17	(2 %)	34	(2 %)
Potatoes	1145	(36 %)	351	(38 %)	646	(35 %)
Fruit	204	(6 %)	87	(9 %)	131	(7 %)
Vegetables	321	(10 %)	181	(20 %)	234	(13 %)
Total production	3166	(100 %)	933	(100 %)	1774	(100 %)

Source: Own computations based on GHS.

In the observed year, the average household in the sample produced food worth of 1.774 Million Belarusian Roubles. Evaluated at an exchange rate for December 2000 of 982,5435 BYR/€ this is equivalent to 1806 €. The value is more than three times higher in rural than in urban settlements. In both, rural and urban households, the largest share in the value of production (36 % and 38 % resp.) is contributed by the basic staple food item, potatoes. In rural households meat products, particularly pork, have an almost equal share in the total value of production: 35 %. Also dairy products have a larger share in rural than in urban households. For urban households, fruit and vegetables, together representing 29 % of the production value, make up the second most important group.

<sup>13</sup> We can not extract from the survey data information on the share of those households engaged in production of the various food types among all households. Such information and other inference on the distribution would require survey data on periods that are long enough to justify interpretation of the figures as means for individual households over time. Such information is not available because the survey period in the GHS is only one single week, and no information is available that allows matching households that were interviewed repeatedly (Chapter 2).

**Figure 4.3: Composition of the total value of household food production**

Source: Own computations based on GHS.

Since the data collected in the GHS can only be grouped into categories representing two sides of a balance of food availability and utilization, no direct link between individual items on the two sides of the balance can be established. On the other hand, it is likely that some food originating from specific sources is being used in particular ways. Thus, it can be assumed that food sold rarely originates from purchases but is more likely being produced by the households. Therefore, there seems to be a justification for associating certain categories of the availability side of the food balance with certain categories of the utilization side. Tables 4.5 and 4.6 report on the utilization of food other than for own consumption. They build an association of food production on the one hand with feed use, give away, and sale of food on the other hand. The tables focus on food groups while Appendix Table A2.19 provides the respective figures for disaggregated food items.

In Table 4.5, the row for each product group (and the aggregate 'All products', respectively) reports on the value of (i) feed use, (ii) unpaid give-aways, and (iii) sale in relation to the total value of production for that product group.<sup>14</sup> All of these ratios are below 20 percent and most of them below 10 percent, suggesting that the by far largest part of food produced by the households in our sample is used for own consumption. 2.2 percent of the value of food production is the value of feed use. However, the value share of feed use of food products is not

<sup>14</sup> This ratio can not be called a 'share' in the strict sense because parts of feed use, give-aways, and sales may stem from sources other than production (e.g. purchase). The GHS data do not allow to compute exactly the shares of different ways of utilization within the self-produced quantities exclusively. However, output of household production of each product group can be assumed to be the main source for foods used as feeds, given away or sold and its value represents a meaningful reference to assess the relevance of different ways of utilization.

reflected very well by the figures for product aggregates as in Table A2.19. Yet the largest shares of feed use are found for potatoes (4.93 %) milk products (2.01 %), and 'other products' (3.53 %). Within the 'other food' aggregate it is in particular ground grains ('flour'), 20.5 percent of which is equal to the value of grains used as feeds for livestock. However, in this case, livestock breeders may have purchased considerable parts of such feeds or have received them from large collective farms.

In Table 4.6, the corresponding row reports on each product group's relevance in total feed use, total give-away and total sale, respectively. It shows that almost 80 percent of the value of food used as feeds is represented by potatoes followed by vegetables with 8.4 %.

Unpaid transfers between households are very significant in our household sample (and in Belarus in general), as has been pointed out in Section 3.4. This way of utilization makes up 10.41 percent of the value of self-produced 'other food' (pastries: 21 %, bread and bakery products: 4.8 %, fats and oils: 3.5 %) but these quantities most likely also include some purchased food. Also, relative to the output of hunted game ('other meat'), sausages, other meat products and 'other fruit' a considerable amount of these products is transferred to other households. While for the mentioned narrowly defined product groups non-monetary transfers present a considerable percentage of production (or availability), even a small percentage of the large product groups 'fruit' and 'vegetables' represents 34 percent of the value of all give-aways.

Sale represents the most significant way of utilization aside from consumption: Around 9 percent of the value of self-produced milk products and potatoes are being sold. For some food producing households (those at the threshold to be market oriented farms) sale of agricultural produce makes up a large part of the value of production, but on average, sales amounts to only 4.4 percent of the production value. Measured by their value shares in total food sales of the sample households potatoes are most important (74 % of total sales), but also dairy products (12.6 %) and meat (7.7 %) are important products regarding their sales value.

**Table 4.5: Household food production – Selected food utilization categories in relation to household food production [%]**

	Utilization		
	Feed use	Give away	Sale
<b>Meat</b>	0.06	0.40	1.05
<b>Dairy products</b>	2.01	1.33	8.93
<b>Eggs</b>	.	1.11	1.00
<b>Potatoes</b>	4.93	0.27	9.21
<b>Fruit</b>	0.49	3.60	0.10
<b>Vegetables, mushrooms</b>	1.40	0.61	1.36
<b>Other products</b>	3.53	10.41	0.75
<b>All products</b>	2.23	1.01	4.40

Source: Own computations based on GHS.

**Table 4.6: Household food production – Shares of food product groups in selected utilization categories [%]**

	Utilization		
	Feed use	Give away	Sale
<b>Meat</b>	0.8	13	7.7
<b>Dairy products</b>	5.6	8.2	12.6
<b>Eggs</b>	.	2.1	0.4
<b>Potatoes</b>	78.6	9.6	74.4
<b>Fruit</b>	1.6	26.7	0.2
<b>Vegetables, mushrooms</b>	8.4	8.1	4.1
<b>Other products</b>	4.9	32.3	0.5
<b>All products</b>	100.0	100.0	100.0

Source: Own computations based on GHS.

To sum up, food production is an omnipresent phenomenon among the GHS households. Three quarters of the families and almost all rural families use a small piece of land and a third of the households keep livestock, mainly pigs and poultry. The input of family labour is considerable (on average of 24 hours per week) while the use of capital and variable inputs is relatively low if compared to market oriented farms. The value of goods produced annually amounted on average to almost 1.8 million Belarusian Roubles (1806 €), in rural households almost twice that amount. This supports the view that under the present economic situation household food production is a highly necessary coping strategy for many households.

## 5 CONCLUSIONS AND FURTHER TASKS

The paper reports the most important results of a survey on the food situation of households in the Grodno region, Belarus. The survey that has been conducted on a monthly basis between September 2000 and August 2001 is understood as a pilot study allowing preliminary insights and to gain specific experience for further research on the topic. 80 households were surveyed during each month.

The analysis shows that potatoes and vegetables play a significant role in the diet of the households. Potatoes are by far the most common staple food item, 97 percent of which are also produced on households' land plots rather than purchased. In general, household food production plays an important role. It contributes 57 percent of the value of the food available in households. On average, this is equivalent to a value of 1.8 million Belarusian Roubles (1806 €), in rural households almost twice that value.

Prices of purchased food are mostly higher in rural than in urban areas and higher in public markets than in retail shops. Shops are the most frequently used sources for purchased food, markets play a larger role only for fruit and vegetables. Meat and meat products take the largest share (43 %) in the value of food consumed by households. Transfers of food between households without payment (non-monetary transfers), i.e. as gifts, compensation for services rendered, or as compensation in barter deals, play a large role among the survey households, especially to receive and to give away food as gifts (most frequently pastries).

A third of the survey households keep livestock (predominantly pigs and poultry) while three quarters use small land plots (on average 0.15 ha) to produce vegetables, potatoes, fruit, and other crops. The high incidence of household food production is a critical issue from the

economic perspective. There are several reasons to expect that labour productivity is relatively low in very small sized production units. The use of labour saving technology may not be feasible for these household farms. Moreover, a number of fixed cost components (e.g. for transportation from the residence to the dacha), may be very large relative to the value of the output. Finally, the labour capacity of the family members is oftentimes not being fully utilised around the year. If the production factors (land, fixed capital) of several of such very small production facilities were combined to form a considerably larger unit, this could result in considerably higher labour productivity and a sufficient income capacity for a family or more. However, considering the decline of earning opportunities in former large-scale agriculture and in non-agricultural firms the increase of household food production becomes understandable. For a growing part of the population, it contributes considerably to their livelihood. This effect of household food production to be a social buffer has been found to be important in other studies on transition countries (THO SEETH et al, 1998; KOSTOV and LINGARD, 2004). The members of the survey households devoted 24 hours of family labour per week to food production.

A number of gaps and weaknesses in the data base compiled from the survey became evident. This suggests some consequences for future research. It seems indispensable to have trained personnel assist the respondents in completing the questionnaires on production and consumption and transfers of food. Information on sociodemographic characteristics of the households covering all members is necessary. In order to allow inferences on the distribution of annual means, it is necessary to arrange repeated participation of identifiable households over the year. Ideally it should be possible to compile a set of panel data. Finally, some experts suggest that the large importance of household food production in the former Soviet Union is partly due to the fact that a certain cohort of people is very attached to household farming. They particularly refer to household members who had been working for many years in state owned large scale farms. When these people grow older, a relatively fast change in these structures may arise. Whether this expectation is justified also for the Republic of Belarus is an open question, which should be answered by further research.

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	shop		market		kiosk		other	
	quantity (g)	(Rbl.)	quantity (g)	(Rbl.)	quantity (g)	(Rbl.)	quantity (g)	(Rbl.)
other meat								
sausages								
meat preserves								
other meat products								
fish and fish products								
milk (l)								
kefir								
yoghurt and cream								
butter								
cheese								
other dairy products								
eggs (pcs.)								
plant products								
fats and oils								
potatoes								
apples								
berries								
other fruit								
cabbage								
lettuce								
tomatoes								
cucumber								
onions								
carrots								
pulses								
mushrooms								
other vegetables								
bread and bakery products								
flour								
rice								
pasta								
sugar								
pastries								
tea, coffee								
alcoholic beverages (l)								
non-alcoholic beverages (l)								

## D. Receipt of food as wage, as a gift or in barter deals during this week

1. Did you receive food as wage payment in kind during this week?

 yes no

If yes, what kind of food in which quantity? Please estimate the monetary value of these products. For which work did you receive the food?

type of food	quantity (g, l, piece)	estimated value (Rbl.)	For which work?



2. Did you receive food as a gift during this week?

- yes
- no

If yes, what kind of foodstuffs in which quantity? Please estimate the monetary value of these products.

type of food	quantity (g, l, piece)	estimated value (Rbl.)	From whom?

3. Did you receive food in barter deals during this week?

- yes
- no

If yes, what kind of food in which quantity? Please estimate the monetary value of these products.

type of food	quantity (g, l, piece)	estimated value (Rbl.)	From whom?

E. Utilization of available food as wage, as a gift or in barter deals during this week

1. Did you give away food as wage payment in kind during this week?

- yes
- no

If yes, what kind of food in which quantity? Please estimate the monetary value of these products. For which work did you pay with this food?

type of food	quantity (g, l, piece)	estimated value (Rbl.)	For what?

2. Did you give away food as a gift during this week?

- yes
- no

If yes, what kind of food in which quantity? Please estimate the monetary value of these products.

type of food	quantity (g, l, piece)	estimated value (Rbl.)	To whom?

3. Did you give away food in barter deals during this week?

- yes
- no

If yes, what kind of food in which quantity? Please estimate the monetary value of these products?

type of food	quantity (g, l, piece)	estimated value (Rbl.)	To whom?

F. Other sources and possible utilization of food during this week

What were the sources of the following food for your household? Please give a statement about the purpose and the used quantity (in gram)

	source			utilization				
	production	hunting, fishing, collection	removal from stocks	consumption	storage	animal feed	sale	spoilage
animal Products								
beef								
pork								
bacon								
mutton								
poultry								
other meat								
sausages								

	source			utilization				
	production	hunting, fishing, collection	removal from stocks	consumption	storage	animal feed	sale	spoilage
meat preserves								
other meat products								
fish								
fish-products								
milk (l)								
kefir								
yoghurt and cream								
butter								
cheese								
other dairy prod- eggs (pcs.)								
plant products								
fats and oils								
potatoes								
apples								
berries								
other fruit								
cabbage								
lettuce								
tomatoes								
cucumber								
onions								
carrots								
pulses								
mushrooms								
other vegetables								
bread and bakery								
flour								
rice								
pasta								
sugar								
pastries								
tea, coffee								
alcoholic beverages								
non-alcoholic bev- erages (l)								

G. General conditions of household production of food

1. Do you own plot(s), where you produce food?

- yes  
 no

If yes, is it

- a garden  
 'datcha': A garden or land plot at the datcha, outside town  
 'LPX': A larger garden or land plot used in connection with a large commercial/collective farm

2. When did you purchase the plot(s)?  
 During Soviet times  
 After independence  
 If the latter applies, what was the reason for the plot-purchase?

\_\_\_\_\_

\_\_\_\_\_

3. What is the size of the pieces of land used for food production (in Morgen)? \_\_\_\_\_

4. Extent of working hours for food production in his week

How many household members work in food production?  
 How many hours during this week?  
 How old are the working household members?  
 What kind of education do they have?  
 What kind of job besides household production do they have?

Household member	Sex	Age	Education	Type of work	Manhours for food production
1					
2					
3					
4					

5. Buildings, livestock, machines and other production factors used for household production during this week

	extent and quantity	price	of which in household's property
buildings or sheds (m <sup>2</sup> available, without living space)			
livestock (number)			
cows			
cattle			
pigs			
chicken and hens			
other poultry			
sheeps and goats			
horses			
other animals			
machines (type and number)			
feed (type and quantity)			
fertilizer (type and quantity)			
organic fertilizer			
mineral fertilizer			

H. Comments

**A2: Tables reporting results of descriptive data analyses****Table A2.1: Per-capita consumption: Quantity and monetary value**

	per-capita consumption kg/year	per-capita consumption <i>thsd.</i> BYR	per-capita consumption €
beef	9,9	27	28
pork	66,0	175	178
bacon	9,0	22	22
mutton	0,5	1	2
poultry	12,7	28	28
other meat	2,9	7	4
sausages	16,0	52	53
meat preserves	1,3	4	4
other meat products	1,7	5	5
meat and -products	120,1	321	327
fish and -products	14,6	27	28
milk (l)	105,6	25	26
kefir	25,5	9	9
yoghurt and cream	10,0	13	13
butter	5,5	13	13
cheese	3,8	10	10
other dairy products	7,7	11	11
milk and dairy products	324,0*	81	82
eggs (pcs.)	284,2	22	23
fats and oils	9,0	12	12
potatoes	536,3	140	140
apples	57,9	24	25
berries	14,4	19	19
other fruit	14,1	17	17
fruit	86,4	60	61
cabbage	34,8	10	10
lettuce	1,3	1	1
tomatoes	18,6	18	18
cucumber	22,2	17	18
onions	18,4	8	8
carrots	15,2	5	6
pulses	1,2	1	1
mushrooms	9,2	19	19
other vegetables	7,7	6	6
vegetables	128,6	86	88
bread and bakery prod.	66,2	37	38
flour	9,9	6	7
pasta	11,1	9	9
grain products**	87,2	52	53
rice	4,2	3	3

	per-capita consumption kg/year	per-capita consumption thsd. BYR	per-capita consumption €
sugar	10,8	8	9
pastries	7,1	17	18
sugar and pastries	17,9	26	26
tea, coffee	1,8	14	14
alcoholic beverages (l)	4,6	13	13
non-alcoholic beverages (l)	27,2	13	13
beverages***		39	40
all		870	882

Source: Own computations based on GHS

Notes: \* In milk-equivalents.

\*\* Bread and bakery products, pasta, flour.

\*\*\* Alcoholic drinks, non-alcoholic drinks, coffee, tea.

**Table A2.2: Shares of different sources of food in quantity available**

	all	purchase	NMT received	production, hunt, fishing, collection
	%	%	%	%
beef	100	49,3	0,0	50,7
pork	100	41,3	4,1	54,6
bacon	100	21,1	0,7	78,2
mutton	100	81,9	0,0	18,1
poultry	100	66,8	2,2	31,0
other meat	100	52,7	1,4	45,8
sausages	100	89,4	0,8	9,8
meat preserves	100	64,6	6,0	29,4
other meat products	100	82,6	9,6	7,8
fish and -products	100	63,7	0,3	36,1
milk	100	40,6	0,8	58,6
kefir	100	84,0	0,0	16,0
yoghurt and cream	100	93,4	1,5	5,1
butter	100	66,8	3,1	30,1
cheese	100	67,5	0,1	32,4
other dairy products	100	81,6	3,4	15,1
eggs	100	59,7	2,3	38,0
fats and oils	100	91,2	0,5	8,3
potatoes	100	1,9	1,3	96,8
apples	100	18,5	2,5	79,0
berries	100	17,4	1,5	81,1
other fruit	100	59,8	6,5	33,7
cabbage	100	11,8	2,6	85,6
lettuce	100	28,6	0,0	71,4
tomatoes	100	24,4	0,6	75,0
cucumber	100	12,6	0,0	87,4

	all	purchase	NMT received	production, hunt, fishing, collection
	%	%	%	%
onions	100	9,7	1,2	89,1
carrots	100	13,0	0,7	86,3
pulses	100	37,0	1,4	61,5
mushrooms	100	5,8	0,2	94,1
other vegetables	100	39,0	3,1	57,8
bread and bakery prod.	100	95,9	0,4	3,6
flour	100	59,5	8,5	32,0
rice	100	98,8	0,0	1,2
pasta	100	94,6	0,6	4,8
sugar	100	76,8	12,9	10,4
pastries	100	70,0	7,8	22,2
tea, coffee	100	96,1	1,4	2,5
alcoholic beverages	100	88,7	1,0	10,3
non-alcoholic beverages	100	86,7	2,1	11,2

Source: Own computations based on GHS.

**Table A2.3: Monetary value of purchase and household production**

(per household and year)	purchase		production		all		purchase €	production €	all €
	thsd BYR	%	thsd BYR	%	thsd BYR	%			
beef	48,7	3,6	54,7	2,9	103,3	3,2	49,5	55,7	105,2
pork	240,6	18,0	379,9	20,2	620,5	19,3	244,9	386,6	631,5
bacon	14,6	1,1	70,2	3,7	84,9	2,6	14,9	71,5	86,4
mutton	3,8	0,3	1,0	0,1	4,8	0,1	3,9	1,1	4,9
poultry	65,3	4,9	34,4	1,8	99,7	3,1	66,4	35,1	101,5
other meat	12,2	0,9	13,6	0,7	25,8	0,8	12,4	13,8	26,2
sausages	167,1	12,5	20,2	1,1	187,4	5,8	170,1	20,6	190,7
meat preserves	7,3	0,5	4,3	0,2	11,6	0,4	7,4	4,4	11,8
other meat products	12,7	0,9	1,5	0,1	14,2	0,4	12,9	1,6	14,5
fish and -products	61,0	4,6	39,0	2,1	100,0	3,1	62,1	39,7	101,8
milk (l)	40,7	3,0	63,5	3,4	104,2	3,2	41,4	64,6	106,1
kefir	23,9	1,8	5,8	0,3	29,7	0,9	24,3	5,9	30,2
yoghurt and cream	37,3	2,8	2,6	0,1	40,0	1,2	38,0	2,7	40,7
butter	31,9	2,4	15,5	0,8	47,5	1,5	32,5	15,8	48,3
cheese	23,6	1,8	13,0	0,7	36,6	1,1	24,0	13,2	37,2
other dairy products	21,8	1,6	6,5	0,3	28,3	0,9	22,2	6,6	28,8
eggs (pcs.)	40,8	3,1	33,2	1,8	74,0	2,3	41,5	33,7	75,3
fats and oils	36,0	2,7	4,0	0,2	40,0	1,2	36,6	4,0	40,7
potatoes	9,9	0,7	621,6	33,0	631,6	19,6	10,1	632,7	642,8
apples	15,7	1,2	76,9	4,1	92,6	2,9	16,0	78,2	94,2
berries	5,5	0,4	60,5	3,2	66,0	2,0	5,6	61,5	67,1
other fruit	33,5	2,5	24,2	1,3	57,8	1,8	34,1	24,7	58,8
cabbage	4,1	0,3	37,0	2,0	41,1	1,3	4,2	37,6	41,8

(per household and year)	purchase		production		all		purchase €	production €	all €
	thsd BYR	%	thsd BYR	%	thsd BYR	%			
lettuce	0,8	0,1	2,9	0,2	3,7	0,1	0,8	2,9	3,7
tomatoes	13,6	1,0	54,0	2,9	67,6	2,1	13,8	55,0	68,8
cucumber	6,3	0,5	60,3	3,2	66,7	2,1	6,4	61,4	67,8
onions	3,7	0,3	29,9	1,6	33,6	1,0	3,8	30,4	34,2
carrots	2,5	0,2	19,2	1,0	21,8	0,7	2,6	19,6	22,1
pulses	1,8	0,1	4,1	0,2	5,9	0,2	1,9	4,1	6,0
mushrooms	3,7	0,3	70,8	3,8	74,6	2,3	3,8	72,1	75,9
other vegetables	7,4	0,6	13,2	0,7	20,7	0,6	7,6	13,5	21,0
bread and bakery pod.	120,7	9,0	5,4	0,3	126,0	3,9	122,8	5,5	128,3
flour	15,4	1,2	8,7	0,5	24,2	0,8	15,7	8,9	24,6
rice	10,5	0,8	0,1	0,0	10,7	0,3	10,7	0,2	10,9
pasta	29,5	2,2	1,7	0,1	31,2	1,0	30,0	1,7	31,7
sugar	23,0	1,7	3,5	0,2	26,4	0,8	23,4	3,5	26,9
pastries	37,1	2,8	14,7	0,8	51,8	1,6	37,7	15,0	52,7
tea, coffee	35,0	2,6	1,4	0,1	36,3	1,1	35,6	1,4	37,0
alcoholic beverages (l)	28,7	2,1	5,2	0,3	33,9	1,1	29,2	5,3	34,5
non-alcoholic beverages (l)	39,0	2,9	5,7	0,3	44,6	1,4	39,7	5,8	45,4
all	1337,0	100,0	1883,9	100,0	3220,9	100,0	1360,7	1917,4	3278,1

Source: Own computations based on GHS.

**Table A2.4: Food expenditure by product groups (purchase)**

(per household and year)	thsd. BYR	%	€
meat and -products	572,2	42,8	582,4
fish and -products	61,0	4,6	62,1
milk and dairy products	179,3	13,4	182,4
eggs	40,8	3,1	41,5
fats and oils	36,0	2,7	36,6
potatoes	9,9	0,7	10,1
vegetables and fruit	98,9	7,4	100,6
grain products and rice	176,2	13,2	179,3
sugar, pastries	60,0	4,5	61,1
beverages	102,7	7,7	104,5
all	1337,0	100,0	1360,7

Source: Own computations based on GHS.

**Table A2.5: Food purchases by point of sale**

	all		shop		market		kiosk		other	
	g p.c. and week	%	g p.c. and week	%	g p.c. and week	%	g p.c. and week	%	g p.c. and week	%
beef	93	100	57	60,8	35	37,9			1	1,3
pork	525	100	121	23	94	17,9			310	59,1
bacon	29	100	14	48	13	43,9			2	8
mutton	4	100	1	21,3	3	73,5			0	5,1
poultry	157	100	108	68,6	44	28,1	0	0,2	5	3,2
other meat	29	100	12	40,4	10	35,4	0	0,9	7	23,3
sausages	272	100	217	79,8	52	19	0	0	3	1,2
meat preserves	15	100	9	55,7	6	42,1	0	2,2		
other meat products	26	100	19	74	7	25			0	1
fish and -products	179	100	97	53,9	81	45,4	1	0,4	1	0,3
milk (l)	1	100	1	94,4	0	2,6			0	2,9
kefir	413	100	402	97,4	9	2,2	0	0,1	2	0,4
yoghurt and cream	182	100	176	97	4	2,5	0	0,1	1	0,4
butter	70	100	68	96,8	2	3,1	0	0,1		
cheese	49	100	46	95,3	2	4,7				
other dairy products	113	100	110	96,8	2	2,1	0	0,2	1	0,8
eggs (pcs.)	3	100	2	77,9	0	18,8	0	0,3	0	3
fats and oils	159	100	65	40,8	93	58,3	1	0,5	1	0,3
potatoes	224	100	71	31,9	85	38,1			67	30
apples	208	100	86	41,1	110	52,9	3	1,2	10	4,8
berries	48	100	8	15,9	18	37,2	0	0,3	22	46,7
other fruit	178	100	44	24,8	131	74	0	0,2	2	1,1
cabbage	85	100	36	42,7	42	49,6	1	0,6	6	7
lettuce	7	100	1	18,3	5	65,5			1	16,2
tomatoes	84	100	31	36,4	48	56,7	1	1,3	5	5,6
cucumber	54	100	17	30,8	32	59,5	1	2,3	4	7,4
onions	33	100	11	32,7	16	48,8			6	18,6
carrots	40	100	14	36,6	17	44,2	0	0,3	7	18,9
pulses	10	100	3	33,2	5	49,4			2	17,4
mushrooms	10	100	2	15,3	2	22,1			6	62,6
other vegetables	57	100	11	19,7	44	76,5			2	3,8
bread and bakery prod.	1223	100	1195	97,7	21	1,7	2	0,1	5	0,4
flour	120	100	83	68,9	32	26,4	1	0,9	5	3,8
rice	80	100	42	53	34	41,9			4	5
pasta	201	100	126	62,6	72	36,1	1	0,6	1	0,6
sugar	159	100	113	70,9	44	27,8	1	0,5	1	0,7
pastries	99	100	71	71,5	26	26,5	1	1,2	1	0,8
tea, coffee	25	100	11	42,4	14	56	0	0,9	0	0,7
alcoholic beverages (l)	0	100	0	92,8	0	4	0	0,8	0	2,4
non-alcoholic beverages (l)	0	100	0	76,7	0	18,5	0	3,4	0	1,3

Source: Own computations based on GHS.



**Table A2.6: Computed average prices (whole observation period, deflated, price basis Dec. 2000)**

product	N	Mean (BYR/g)	Std Dev	Minimum	Maximum	Var Koeff = Std Dev / Mean
beef	198	2,7262	0,8698	0,9000	5,0000	0,3191
pork	417	2,6466	0,8899	0,1992	8,0000	0,3362
bacon	128	2,4244	0,6581	1,5000	5,0000	0,2714
mutton	12	3,0833	0,3218	2,5000	3,5000	0,1044
poultry	382	2,1869	0,6305	1,1333	5,0000	0,2883
other meat	73	2,5394	0,7940	1,1667	5,0000	0,3127
sausages	721	3,2392	1,3137	0,3333	9,0000	0,4056
meat preserves	92	2,8727	1,8452	0,9633	9,6000	0,6423
other meat products	81	2,8442	1,4305	1,1500	7,0000	0,5030
fish and -products	450	1,8552	0,8147	0,1000	6,0000	0,4391
milk (l)	720	237,0918	115,4427	10,9000	1000,0000	0,4869
kefir	553	0,3543	0,3071	0,0143	1,7143	0,8668
yoghurt and cream	617	1,3020	0,7442	0,1000	6,0000	0,5716
butter	600	2,3827	1,0313	0,3333	7,5000	0,4328
cheese	364	2,6517	1,1672	0,8333	8,0000	0,4402
other dairy products	246	1,3933	0,8071	0,4000	4,0000	0,5793
eggs (piece)	569	77,7232	25,3461	29,1715	150,0000	0,3261
fats and oils	608	1,3277	1,0194	0,1143	15,0000	0,7678
potatoes	165	0,2571	0,2629	0,0006	2,0000	1,0226
apples	289	0,4176	0,3141	0,0233	2,0000	0,7522
berries	35	1,3075	0,7684	0,1700	3,0000	0,5877
other fruit	319	1,1754	0,6833	0,1000	5,0000	0,5813
cabbage	157	0,2891	0,2315	0,0105	1,3500	0,8008
lettuce	19	0,8034	0,5525	0,0750	2,0000	0,6877
tomatoes	168	0,9699	0,5610	0,3000	3,0000	0,5784
cucumber	110	0,7793	0,5061	0,2000	2,0243	0,6494
onions	115	0,4421	0,3404	0,0400	1,5000	0,7700
carrots	110	0,3536	0,2268	0,0210	1,0500	0,6414
pulses	36	1,1313	1,3042	0,2000	6,0000	1,1528
mushrooms	23	2,0576	1,5205	0,1000	6,6667	0,7390
other vegetables	76	0,7434	0,5868	0,0800	4,0000	0,7893
bread and bakery prod.	923	0,5593	0,4128	0,0313	3,7000	0,7381
flour	263	0,6466	0,3789	0,1950	2,0000	0,5860
rice	266	0,7212	0,3981	0,0400	3,0000	0,5520
pasta	538	0,7866	0,3611	0,0500	3,0000	0,4591
sugar	411	0,7729	0,3704	0,2600	2,3000	0,4792
pastries	432	2,4597	1,7263	0,0400	10,5175	0,7018
tea, coffee	540	7,4864	3,7572	2,5000	20,0000	0,5019
alcoholic beverages (l)	176	2741,7800	2018,6500	520,0000	9000,0000	0,7363
non-alcoholic beverages (l)	461	453,7114	237,4652	147,0000	1333,3300	0,5234

Source: Own computations based on GHS.

**Table A2.7: Computed average prices (December 2000)**

product	N	Mean (BYR/g)	Std Dev	Minimum	Maximum	Var Koeff = Std Dev / Mean
beef	15	2,3908	0,6359	1,4286	3,8333	0,2660
pork	29	2,4214	0,5970	1,5000	4,0000	0,2466
bacon	10	2,0000	0,5121	1,3000	3,0000	0,2561
mutton						
poultry	23	2,0220	0,5064	1,5000	3,2000	0,2504
other meat	7	2,3500	1,2169	1,4000	5,0000	0,5178
sausages	61	2,9683	1,0639	0,9500	6,4000	0,3584
meat preserves	7	4,8095	2,7896	1,5000	10,0000	0,5800
other meat products	6	3,6262	2,1119	1,6571	7,0000	0,5824
fish and -products	35	1,7334	0,5773	0,9500	3,0000	0,3330
milk (l)	63	175,7867	64,2943	44,4444	500,0000	0,3658
kefir	52	0,2671	0,2286	0,0667	1,2300	0,8559
yoghurt and cream	54	1,2050	0,5362	0,6000	3,0000	0,4450
butter	50	2,0096	0,7528	0,9000	5,0000	0,3746
cheese	31	2,4899	0,5314	1,6667	4,2000	0,2134
other dairy products	13	1,8404	1,4899	0,5000	6,0000	0,8096
eggs (piece)	43	67,0500	19,3071	0,6000	120,0000	0,2880
fats and oils	55	1,0546	0,3453	0,6000	2,1250	0,3274
potatoes	12	0,1432	0,1294	0,0600	0,5000	0,9036
apples	36	0,3513	0,1919	0,1500	0,8000	0,5463
berries						
other fruit	20	1,3157	0,6787	0,6000	3,0000	0,5158
cabbage	13	0,0942	0,0338	0,0700	0,2000	0,3588
lettuce						
tomatoes	5	0,8833	0,1951	0,7000	1,1667	0,2209
cucumber	2	1,9000	0,1414	1,8000	2,0000	0,0744
onions	15	0,4247	0,4296	0,0400	1,5000	1,0115
carrots	10	0,3467	0,3543	0,0367	1,0000	1,0219
pulses	2	0,9500	0,0707	0,9000	1,0000	0,0744
mushrooms	2	0,8500	1,0607	0,1000	1,6000	1,2479
other vegetables	3	0,8267	1,1909	0,0800	2,2000	1,4405
bread and bakery prod.	76	0,5206	0,3437	0,1250	2,0000	0,6602
flour	28	0,4671	0,2675	0,2100	1,7000	0,5727
rice	22	0,5291	0,1294	0,4000	0,9000	0,2446
pasta	52	0,6070	0,1555	0,4000	1,1000	0,2562
sugar	37	0,6853	0,2882	0,3500	1,6000	0,4205
pastries	40	2,1699	0,8673	1,0000	4,6667	0,3997
tea, coffee	42	5,8380	1,9389	3,0000	11,0000	0,3321
alcoholic beverages (l)	16	3360,8200	1060,8000	1400,0000	6000,0000	0,3156
non-alcoholic beverages (l)	40	340,6139	160,4832	100,0000	883,3333	0,4712

Source: Own computations based on GHS.

**Table A2.8: Comparison between prices in urban and rural areas**

product	average price (BYR/g)		Kolmogorov-Smirnov		F-test		t-test Pooled (equal variances)		t-test Satterthwaite (unequal var.)		Wilcoxon rank sum test		
	u=urban	r=rural	Statistic D	Pr > D	F Value	Pr > F	t Value	Pr >  t	t Value	Pr >  t	Statistic	Z <sup>15</sup>	Two-Sided Pr > Z
beef	u	2,7644	0,0725	0,0437	1,60	0,1056	0,12	0,9017					
	r	2,7448	0,1639	0,0157									
pork	u	2,6763	0,1052	<0,0100	1,50	0,0107			0,22	0,8226			
	r	2,6510	0,1453	<0,0100									
bacon	u	2,4355	0,1598	<0,0100	1,59	0,0894	0,80	0,4227					
	r	2,3274	0,1769	<0,0100									
mutton	u	3,1667	0,3853	<0,0100							32,5	-	0,7620*
	r	3,3733	0,2642	>0,1500									
poultry	u	2,1248	0,1562	<0,0100	1,03	0,8928	-3,56	<b>0,0004</b>					
	r	2,4009	0,1186	<0,0100									
other meat	u	2,6239	0,1728	<0,0100							614,5	-	0,8369
	r	2,5440	0,1794	0,1268									
sausages	u	3,2570	0,1158	<0,0100	1,22	0,0869	-0,26	0,7953					
	r	3,2842	0,1075	<0,0100									
meat pre-serves	u	2,7768	0,2496	<0,0100	1,72	0,0704	-1,14	0,2590					
	r	3,2630	0,2491	<0,0100									
other meat products	u	3,0852	0,1906	<0,0100	1,05	0,9285	1,90	0,0615					
	r	2,4394	0,2936	<0,0100									
fish and -products	u	1,8997	0,1556	<0,0100	2,87	<0,0001			-0,09	0,9255			
	r	1,9115	0,2297	<0,0100									
milk	u	233,3	0,1579	<0,0100	1,53	0,0001			-1,18	0,2393			
	r	243,6	0,1580	<0,0100									
kefir	u	0,3394	0,2218	<0,0100	1,52	0,0011			-1,63	0,1041			
	r	0,3856	0,2278	<0,0100									
yoghurt and cream	u	1,2589	0,1817	<0,0100	1,04	0,7363	-2,16	<b>0,0309</b>					
	r	1,3897	0,1392	<0,0100									
butter	u	2,3695	0,1924	<0,0100	1,35	0,0265			-0,56	0,5737			
	r	2,4167	0,1842	<0,0100									
cheese	u	2,7300	0,1764	<0,0100	1,91	0,0001			0,41	0,6860			
	r	2,6656	0,1422	<0,0100									
other dairy products	u	1,4134	0,1362	<0,0100	2,07	0,0007			0,96	0,3392			
	r	1,3212	0,1078	0,0402									
eggs	u	77,5477	0,1499	<0,0100	1,06	0,7137	-2,58	<b>0,0103</b>					
	r	84,4338	0,1499	<0,0100									
fats and oils	u	1,3265	0,2631	<0,0100	6,33	<0,0001			1,04	0,2968			
	r	1,2599	0,1501	<0,0100									
potatoes	u	0,2405	0,2207	<0,0100	1,07	0,7478	-0,58	0,5656					
	r	0,2632	0,2185	<0,0100									
apples	u	0,4055	0,2413	<0,0100	2,24	<0,0001			-0,67	0,5044			
	r	0,4272	0,2282	<0,0100									
berries	u	1,3675	0,1416	>0,1500							129,0	-	0,6692
	r	1,2356	0,2681	0,0886									

<sup>15</sup> Z includes a correction of continuity of 0,5.

product	average price (BYR/g) u=urban r=rural	Kolmogorov-Smirnov		F-test		t-test Pooled (equal variances)		t-test Satterthwaite (unequal var.)		Wilcoxon rank sum test				
		Statistic D	Pr > D	F Value	Pr > F	t Value	Pr >  t	t Value	Pr >  t	Statistic	Z <sup>15</sup>	Two-Sided Pr > Z		
other fruit	u	1,2383	0,1294	<0,0100	2,30	<0,0001			-0,46	0,6429				
	r	1,2791	0,1399	<0,0100										
cabbage	u	0,2592	0,1848	<0,0100							2920,0	2,0482	<b>0,0405</b>	
	r	0,3828	0,1510	0,0628										
lettuce	u	0,8404	0,2920	<0,0100	5,25	0,1216	0,48	0,6394						
	r	0,7000	0,3674	0,0245										
tomatoes	u	0,8774	0,1713	<0,0100							4206,0	2,7935	<b>0,0052</b>	
	r	1,1731	0,1312	0,0689										
cucumber	u	0,7881	0,1735	<0,0100	1,18	0,5398	0,11	0,9156						
	r	0,7770	0,2291	<0,0100										
onions	u	0,4954	0,2110	<0,0100	1,57	0,1950	0,61	0,5421						
	r	0,4389	0,2828	<0,0100										
carrots	u	0,3534	0,1964	<0,0100							1207,5	2,5720	<b>0,0101</b>	
	r	0,5057	0,1300	>0,1500										
pulses	u	1,2101	0,2922	<0,0100							76,5	-	0,7120	0,4765
	r	0,6433	0,3256	0,0805										
mushrooms	u	2,2641	0,1920	0,1138							82,5	-	0,0669	0,9472*
	r	4,5764	0,3883	<0,0100										
other vegetables	u	0,7363	0,2255	<0,0100							469,5	1,4887	0,1366	
	r	0,8773	0,1717	>0,1500										
bread and bakery prod.	u	0,5288	0,1292	<0,0100	1,77	<0,0001			-1,14	0,2545				
	r	0,5583	0,1609	<0,0100										
flour	u	0,6166	0,1994	<0,0100	1,85	0,0009			-2,09	<b>0,0387</b>				
	r	0,7495	0,1962	<0,0100										
rice	u	0,6919	0,2217	<0,0100	1,02	0,8921	-1,75	0,0809						
	r	0,7806	0,2224	<0,0100										
pasta	u	0,7420	0,1440	<0,0100	1,73	<0,0001			-3,40	<b>0,0008</b>				
	r	0,8549	0,1649	<0,0100										
sugar	u	0,7342	0,2429	<0,0100	1,35	0,0380			-2,67	<b>0,0081</b>				
	r	0,8382	0,2241	<0,0100										
pastries	u	2,5830	0,2043	<0,0100	2,19	<0,0001			2,88	<b>0,0042</b>				
	r	2,1422	0,1786	<0,0100										
tea, coffee	u	7,1647	0,1448	<0,0100	1,03	0,8230	-2,19	<b>0,0290</b>						
	r	7,9116	0,1736	<0,0100										
alcoholic beverages	u	2898,8	0,1691	<0,0100	1,13	0,6050	1,08	0,2821						
	r	2560,9	0,2075	<0,0100										
non-alcoholic beverages	u	456,2	0,1408	<0,0100	1,02	0,8988	-0,06	0,9491						
	r	457,7	0,1665	<0,0100										

Source: Own computations based on GHS.

Note: \* t-Approximation instead of Normal Approximation was used because of both samples include < 25 observations.

**Table A2.9: Comparison between prices in shops and at markets**

product	average price (BYR/g)		Kolmogorov-Smirnov		F-test		t-test Pooled (equal variances)		t-test Satterthwaite (unequal var.)		Wilcoxon rank sum test		
	s=shop	m=market	Statistic D	Pr > D	F Value	Pr > F	t Value	Pr >  t	t Value	Pr >  t	Statistic	Z <sup>16</sup>	Two-Sided Pr > Z
beef	s	2,8383	0,1426	<0,0100	1,28	0,2486	-0,18	0,8544					
	nr	2,8607	0,1198	<0,0100									
pork	s	2,6247	0,1313	<0,0100	2,87	<0,0001			-3,70	<b>0,0003</b>			
	nr	2,9450	0,1711	<0,0100									
bacon	s	2,3808	0,1495	<0,0100	1,33	0,2827	-2,21	<b>0,0288</b>					
	nr	2,6626	0,2096	<0,0100									
mutton	s	3,0000	0,3625	<0,0100									
	nr	3,4200											
poultry	s	2,0744	0,1605	<0,0100	1,21	0,2732	-5,36	<b>&lt;0,0001</b>					
	nr	2,4371	0,1366	<0,0100									
other meat	s	2,4103	0,1768	<0,0100	1,30	0,4895	-2,97	<b>0,0042</b>					
	nr	2,9757	0,2267	<0,0100									
sausages	s	3,2383	0,1059	<0,0100	1,78	0,0006			-2,51	<b>0,0129</b>			
	nr	3,5309	0,1340	<0,0100									
meat pre-serves	s	3,2966	0,2646	<0,0100	6,21	<0,0001			1,29	0,2001			
	nr	2,7868	0,2375	<0,0100									
other meat products	s	2,8146	0,2078	<0,0100							819,0	0,9183	0,3585
	nr	2,7234	0,1442	>0,1500									
fish and -products	s	1,8621	0,1719	<0,0100	1,19	0,1946	-0,77	0,4441					
	nr	1,9287	0,1647	<0,0100									
milk	s	239,78	0,1581	<0,0100							4475,5	-	0,8582
	nr	208,27	0,1681	>0,1500									
kefir	s	0,3500	0,2115	<0,0100	3,27	0,0008			-0,43	0,6740			
	nr	0,4207	0,4066	<0,0100									
yoghurt and cream	s	1,2947	0,1561	<0,0100	1,24	0,4310	-0,56	0,5757					
	nr	1,3838	0,3340	<0,0100									
butter	s	2,3798	0,1865	<0,0100							5678,5	2,4957	0,0126
	nr	2,9531	0,1716	>0,1500									
cheese	s	2,6294	0,1390	<0,0100							3869,0	2,9448	0,0032
	nr	3,9053	0,1651	>0,1500									
other dairy products	s	1,4134	0,1364	<0,0100							999,0	-	0,1145
	nr	1,2152	0,2268	>0,1500									
eggs	s	76,20	0,1748	<0,0100	1,62	0,0061			-8,91	<b>&lt;0,0001</b>			
	nr	98,36	0,1543	<0,0100									
fats and oils	s	1,2274	0,2491	<0,0100	1,82	<0,0001			-2,16	0,0311			
	nr	1,4023	0,2483	<0,0100									
potatoes	s	0,2429	0,2722	<0,0100	1,66	0,0609	-1,18	0,2408					
	nr	0,2998	0,2032	<0,0100									
apples	s	0,3877	0,1956	<0,0100	2,21	<0,0001			-1,65	0,1007			
	nr	0,4504	0,2804	<0,0100									
berries	s	0,9624	0,2597	>0,1500							68,0	-	0,0724*

product	average price (BYR/g)		Kolmogorov-Smirnov		F-test		t-test Pooled (equal variances)		t-test Satterthwaite (unequal var.)		Wilcoxon rank sum test			
	s=shop	m=market	Statistic D	Pr > D	F Value	Pr > F	t Value	Pr >  t	t Value	Pr >  t	Statistic	Z <sup>16</sup>	Two-Sided Pr > Z	
	n	1,4919	0,1721	0,0882									1,8671	
other fruit	s	1,2669	0,1407	<0,0100	1,42	0,0972	1,45	0,1476						
	n	1,1479	0,0992	<0,0100										
cabbage	s	0,2737	0,1876	<0,0100	1,13	0,6289	-1,57	0,1196						
	n	0,3305	0,1541	<0,0100										
lettuce	s	1,7200	0,3013	0,0526							79,0	1,1011	0,2862*	
	n	0,7864	0,2935	<0,0100										
tomatoes	s	1,1170	0,1375	<0,0100	2,10	0,0014			2,41	<b>0,0180</b>				
	n	0,8772	0,1781	<0,0100										
cucumber	s	0,9195	0,1974	<0,0100	2,59	0,0012			1,26	0,2121				
	n	0,7493	0,1961	<0,0100										
onions	s	0,3874	0,2892	<0,0100	1,74	0,0743	-1,58	0,1175						
	n	0,5170	0,2323	<0,0100										
carrots	s	0,4041	0,2236	<0,0100	2,59	0,0015			0,54	0,5884				
	n	0,3709	0,1593	<0,0100										
pulses	s	0,7137	0,2392	0,0411	64,82	<0,0001			-1,84	0,0833				
	n	1,4736	0,3073	<0,0100										
mushrooms	s	2,7044	0,2784	0,1491							40,5	-	0,5204	0,6115*
	n	2,7250	0,2207	>0,1500										
other vegetables	s	0,6963	0,2416	<0,0100	1,31	0,4502	-0,50	0,6192						
	n	0,7782	0,2152	<0,0100										
bread and bakery prod.	s	0,5600	0,1665	<0,0100	1,54	0,3709	0,52	0,6012						
	n	0,5027	0,3081	<0,0100										
flour	s	0,6253	0,1924	<0,0100	1,63	0,0117			-0,78	0,4393				
	n	0,6698	0,1994	<0,0100										
rice	s	0,6847	0,2402	<0,0100	1,29	0,1443	-1,67	0,0959						
	n	0,7623	0,1763	<0,0100										
pasta	s	0,7661	0,1874	<0,0100	1,47	0,0039			-1,89	0,0596				
	n	0,8236	0,1127	<0,0100										
sugar	s	0,7239	0,2608	<0,0100	1,26	0,1321	-4,01	<0,0001						
	n	0,8837	0,1598	<0,0100										
pastries	s	2,1365	0,1742	<0,0100	1,40	0,0685	-0,73	0,4657						
	n	2,2469	0,1856	<0,0100										
tea, coffee	s	7,2011	0,1597	<0,0100	1,02	0,8878	-2,29	0,0222						
	n	7,9494	0,1739	<0,0100										
alcoholic beverages	s	2843,2	0,1566	<0,0100							625,0	1,2029	0,2290	
	n	3222,2	0,2633	>0,1500										
non-alcoholic beverages	s	432,3	0,1656	<0,0100							18782,5	6,8623	<0,0001	
	n	634,0	0,1122	0,0599										

Source: Own computations based on GHS.

Note: \* t-Approximation instead of Normal Approximation was used because of both samples include < 25 observations.

**Table A2.10: Use of agricultural plots by households**

possession of plot which is used for HFP (C162) (among 946 hh &lt; 500/100 ha)

plot in use		no	yes
urban	N	178	403
	PctN	31	69
rural	N	41	316
	PctN	11	88
All	N	222	721
	PctN	23	76

Source: Own computations based on GHS.

**Table A2.11: Type of production site**

Types* of land plots used		ogorod	datcha	LPX	og+dat	og+LPX	dat+LPX	o+D+L	All
urban	N	125	244	8	34	.	.	2	413
	PctN	30	59	2	8	.	.	0	100
rural	N	188	34	45	19	28	1	3	318
	PctN	59	11	14	6	9	0	1	100
All	N	313	278	53	53	28	1	5	731
	PctN	43	38	7	7	4	0	1	100

Source: Own computations based on GHS.

Notes: \* Ogorod: Small garden or land plot by the residence.

Datcha: Garden or land plot by the datcha, outside town.

LPX: Larger garden or land plot used in connection with large commercial/collective farm.

Combinations: Households use production facilities of several kinds.

**Table A2.12: Time of purchase**

Time of purchase		PostPe- restro- ika	Sowjet Times	All
urban	N	154	253	409
	PctN	38	62	100
rural	N	82	233	315
	PctN	26	74	100
All	N	236	486	724
	PctN	33	67	100

Source: Own computations based on GHS.

**Table A2.13: Total plotsize**

plot size		< 100 sqm	100-500 sqm	0.05- 0.1 ha	0.1- 0.2ha	0.2-0.5 ha	0.5-1.0 ha	1-5 ha	All
urban	N	2	68	155	121	44	7	.	397
	PctN	1	17	39	30	11	2	.	100
rural	N	3	17	68	113	67	32	4	304
	PctN	1	6	22	37	22	11	1	100
All	N	5	85	223	234	111	39	4	701
	PctN	1	12	32	33	16	6	1	100

Source: Own computations based on GHS.

**Table A2.14: Livestock**

	urban			rural			All		
	N	Pc- tN	Mean	N	Pc- tN	Mean	N	Pc- tN	Mean
All livestock	68	12	16.6	232	65	20.9	300	32	19.9
livest units (VE)	66	11	0.8	228	64	1.8	294	31	1.6
cows	13	2	1.1	141	40	1.2	154	16	1.2
bulls	.	.	.	13	4	1.1	13	1	1.1
pigs	47	8	2.1	208	58	2.8	255	27	2.7
hens	58	10	13.4	207	58	14.8	265	28	14.5
geese	2	0	3.5	27	8	5.0	29	3	4.9
turkeys	1	0	2.0	19	5	6.4	20	2	6.2
ducks	4	1	21.0	26	7	9.0	30	3	10.6
hens, chicken	1	0	11.0	3	1	20.0	4	0	17.8
sheep	.	.	.	4	1	3.0	4	0	3.0
horse	2	0	1.0	5	1	1.0	7	1	1.0
rabbit	8	1	12.4	28	8	12.1	36	4	12.2
nutria	2	0	9.5	.	.	.	2	0	9.5

Source: Own computations based on GHS.



**Table A2.15: Feeds, absolute/relative frequency and mean quantity [kg]**

	N	PctN	Mean
N : No of Households using the feed			
PctN : Share of users among all Hh			
Mean : quantity per using Hh [kg]			
any feeds 201	133	44.3	
cereals	51	17.0	6789
mixed fodder	29	9.7	596
root crops	66	22.0	2754
concentrate	27	9.0	807
hay and straw	53	17.7	895
grass	3	1.0	300
waste	1	0.3	20
other feeds	2	0.7	

Source: Own computations based on GHS.

**Table A2.16: Machinery, absolute/relative frequencies and quantity**

	N	PctN	Mean
lorry	7	1.0	1.0
tractor	30	4.3	1.0
other machines	8	1.1	1.0
private car/motorcycle	64	9.2	1.2

Source: Own computations based on GHS.

**Table A2.17: Fertiliser, absolute/relative frequency and mean quantity [kg]**

	N	PctN	Mean
any fertiliser	65	9.3	3321
organic fertiliser	64	9.2	3189
mineral fertiliser	10	1.4	1179

Source: Own computations based on GHS.

**Table A2.18: Composition of output of household food production**

Value per household and year, 1000 BYR

	Both types		urban		rural	
	Sum	PctSum	Sum	PctSum	Sum	PctSum
beef	55	3.1	39	4.1	82	2.5
pork	386	21.5	132	14.0	819	25.4
bacon	71	4.0	30	3.2	141	4.4
sheep- and goat meat	1	0.1	1	0.1	1	0.0
poultry	34	1.9	18	2.0	59	1.8
other meat	4	0.3	2	0.2	8	0.3
sausages	20	1.1	10	1.0	38	1.2
meat preserves	4	0.2	1	0.1	10	0.3
other meat products	2	0.1	1	0.1	2	0.1
fish and -products	3	0.2	2	0.2	4	0.1
milk	64	3.6	15	1.6	147	4.5
kefir	6	0.3	3	0.3	11	0.3
yoghurt and cream	3	0.1	1	0.1	6	0.2
butter	16	0.9	5	0.6	33	1.0
cheese	13	0.7	3	0.3	30	0.9
other dairy products	7	0.4	2	0.2	14	0.4
eggs	34	1.9	17	1.8	62	1.9
fats and oils	4	0.2	4	0.4	5	0.1
potatoes	646	36.1	351	37.4	1145	35.5
apples	80	4.5	58	6.2	118	3.6
berries	28	1.5	17	1.8	45	1.4
other fruit	25	1.4	12	1.3	45	1.4
cabbage	38	2.1	36	3.8	42	1.3
lettuce	3	0.2	3	0.3	3	0.1
tomatoes	56	3.1	34	3.6	91	2.8
cucumber	62	3.5	43	4.6	95	2.9
onions	31	1.7	31	3.3	31	1.0
carrots	20	1.1	17	1.9	24	0.7
pulses	4	0.2	3	0.3	6	0.2
mushrooms	14	0.8	9	1.0	21	0.6
other vegetables	13	0.7	9	0.9	19	0.6
bread and pastries	5	0.3	3	0.3	10	0.3
flour	9	0.5	2	0.2	20	0.6
rice	0	0.0	0	0.0	0	0.0
farinaceous products	2	0.1	1	0.1	3	0.1
sugar	3	0.2	1	0.1	7	0.2
confectionery products	15	0.8	12	1.3	20	0.6
tee, coffee	1	0.1	1	0.1	2	0.1
alcoholic beverages	5	0.3	5	0.5	6	0.2
non-alcoholic beverages	6	0.3	4	0.4	9	0.3

Source: Own computations based on GHS.

**Table A2.19: Utilization of foodstuffs produced by households: Feed, gifts, sale**

First row: Value of feed use, use as gift, and sales relative to the value of production of each product

Second row: Share of each product in total feeds, total gifts, total sales

		animal feed	given free	sale
beef	Pct of product's tot prod	.	.	0.6
	Share among all prod [%]	.	.	0.4
pork	Pct of product's tot prod	0.1	0.1	0.7
	Share among all prod [%]	0.7	1.3	3.5
bacon	Pct of product's tot prod	.	.	4.3
	Share among all prod [%]	.	.	3.9
poultry	Pct of product's tot prod	.	1.8	.
	Share among all prod [%]	.	3.6	.
other meat	Pct of product's tot prod	.	5.3	.
	Share among all prod [%]	.	4.2	.
sausages	Pct of product's tot prod	0.2	3.2	.
	Share among all prod [%]	0.1	3.8	.
other meat products	Pct of product's tot prod	.	5.4	.
	Share among all prod [%]	.	0.5	.
fish and -products	Pct of product's tot prod	.	1.8	0.3
	Share among all prod [%]	.	4.2	0.1
milk	Pct of product's tot prod	3.2	0.5	14.0
	Share among all prod [%]	5.4	1.8	11.9
kefir	Pct of product's tot prod	.	.	5.1
	Share among all prod [%]	.	.	0.4
yoghurt and cream	Pct of product's tot prod	.	2.3	11.0
	Share among all prod [%]	.	0.4	0.4
butter	Pct of product's tot prod	.	1.0	.
	Share among all prod [%]	.	1.0	.
cheese	Pct of product's tot prod	0.6	2.0	.
	Share among all prod [%]	0.2	1.5	.
other dairy products	Pct of product's tot prod	.	10.2	.
	Share among all prod [%]	.	3.9	.
eggs	Pct of product's tot prod	.	1.1	1.0
	Share among all prod [%]	.	2.2	0.4
fats and oils	Pct of product's tot prod	.	3.5	.
	Share among all prod [%]	.	0.8	.
potatoes	Pct of product's tot prod	4.9	0.3	9.2
	Share among all prod [%]	78.6	9.9	74.7
apples	Pct of product's tot prod	0.8	0.4	.
	Share among all prod [%]	1.6	1.9	.
berries	Pct of product's tot prod	.	0.1	.
	Share among all prod [%]	.	0.3	.
other fruit	Pct of product's tot prod	.	17.7	0.5
	Share among all prod [%]	.	25.4	0.2
cabbage	Pct of product's tot prod	2.7	0.5	5.2
	Share among all prod [%]	2.6	1.0	2.5
tomatoes	Pct of product's tot prod	0.3	0.6	.
	Share among all prod [%]	0.4	2.0	.
cucumber	Pct of product's tot prod	0.5	0.8	.
	Share among all prod [%]	0.8	2.8	.
onions	Pct of product's tot prod	.	0.0	4.1
	Share among all prod [%]	.	0.0	1.6
carrots	Pct of product's tot prod	4.2	0.9	0.2
	Share among all prod [%]	2.1	1.0	0.1
pulses	Pct of product's tot prod	24.7	.	.
	Share among all prod [%]	2.6	.	.
other vegetables	Pct of product's tot prod	.	2.1	.
	Share among all prod [%]	.	1.5	.
bread and pastries	Pct of product's tot prod	2.3	4.8	.
	Share among all prod [%]	0.3	1.5	.
flour	Pct of product's tot prod	20.5	1.5	.
	Share among all prod [%]	4.6	0.7	.
sugar	Pct of product's tot prod	.	15.7	.
	Share among all prod [%]	.	3.2	.
confectionery products	Pct of product's tot prod	.	20.7	.
	Share among all prod [%]	.	19.5	.
All	Pct of product's tot prod	4.8	8.7	8.6
	Share among all prod [%]	100.0	100.0	100.0

Source: Own computations based on GHS.

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