THE DYNAMICS OF INDONESIAN CONSUMPTION PATTERNS OF RICE AND RICE-BASED FOOD EATEN AWAY FROM HOME

Dinamika Pola Konsumsi Beras dan Pangan Berbahan Baku Beras yang Dimakan di Luar Rumah di Indonesia

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ABSTRAK

Sebagai makanan pokok hampir seluruh penduduk, beras menempati posisi penting dari sisi sosial, ekonomi, dan politik di Indonesia. Berdasar hal tersebut, penting untuk mengidentifikasi pola konsumsi beras penduduk Indonesia. Penelitian ini bertujuan untuk menganalisis laju konsumsi beras yang dimakan di rumah maupun di luar rumah berupa makanan jadi berbasis beras baik dari sisi pengeluaran maupun jumlahnya. Dengan menggunakan metode matematika dan statistika sederhana, penelitian ini mengolah data Susenas tahun 1996 – 2017 (tujuh set data) dengan membedakan konsumsi rumah tangga menurut lokasi (desa-kota) dan kuintil. Hasil penelitian menunjukkan bahwa selama 1996 – 2017 pengeluaran riil untuk makanan jadi cenderung meningkat, pengeluaran riil dan konsumsi beras per kapita cenderung menurun untuk semua kategori rumah tangga, dan pengeluaran untuk pangan olahan berbasis beras memiliki pola yang berbeda dengan pengeluaran untuk konsumsi beras. Implikasi dari penelitian ini adalah bahwa dalam mengestimasi kebutuhan beras nasional perlu mempertimbangkan jumlah konsumsi beras yang dimakan di luar rumah dan pangan olahan berbasis beras.

Kata kunci: *beras, dinamika pola konsumsi, konsumsi di luar rumah, pengeluaran untuk pangan*

ABSTRACT

As a major staple food for most of the Indonesian population, rice has an important position in terms of social, economic, and political aspects in the country. Because of that position, it is important to identify the rice consumption pattern of Indonesian people. This research aims at analyzing the trends of rice consumption at home and rice-based eaten away from home in terms of weight and expenditure. By using mathematical and simple statistical methods, data of household rice consumption from the National Socioeconomic Survey (Susenas) years 1996 to 2017 (seven data sets) were analyzed by location and income quintiles. Results of these analyses indicated that during 1996 to 2017 the real expenditure of food away from home tended to increase, the real expenditure and per capita of rice consumption for all household categories tended to decrease, and the expenditure for processed rice had different path compared to the expenditure for rice consumption. The implication of this study is the estimation of national demand for rice should consider the amount of rice eaten away from home consumption and also processed rice.

Keywords: *consumption pattern dynamics, eaten away from home, food expenditure, rice*

INTRODUCTION

On the global level, there is a consensus that per capita consumption of rice will decline over time, although total demand could rise through 2050 due to population growth (Sharma 2014). Timmer et al. (2010) estimate that the share Asia in the global rice demand total will fall considerably between now and 2050 (from 88% to 75%), while that of Africa will more than double (from 6% to 15%. In Southeast Asia, especially in Indonesia, rice is a national strategic commodity, and it is not only a staple food for the majority of Indonesia but also as an economic commodity, which absorbs millions of job opportunities, especially in rural areas. Instabilities of rice supplies and prices give some consequences not only on economic activities but also on social and political stability in Indonesia (Subejo 2014).

As a major food staple for most of the Indonesian population, the participation rate of rice consumption for Indonesian was near 100%. Rice consumption tended to decrease by 4,4% per year from 1996 through 2011. As a consequence, the share of rice in calorie

consumption is also declining accordingly (Rachman and Purwantini 2014).

Indonesian rice production in 2015 was 75.40 million tons of unhusked rice or 47.30 million tons equivalent of rice (BPS 2016). Total rice production in Indonesia is projected to increase at 1.33% annually over the baseline, largely due to yield improvement of 1.25%, as the increase in harvested area is marginal (0.08%). Meanwhile, total rice consumption grew at 0.90% per year solely due to population growth, as per capita consumption is projected to decline by 0.06% annually over the baseline (Wailes and Chavez 2012). Related to rice production, since 2018, BPS was using a KSA (area sample frame) method to calculate rice production in Indonesia (BPS 2017). Rice production in Indonesia in 2018 with KSA was 56,54 million ton GKG or 32,42 million ton rice (BPS 2018).

In 1999, both for the urban and the rural population in Indonesia, the largest share of household expenditure was grains. It was found that the spending on grains in the rural population reached 22.1%. This is reasonable because the component of grains is stapled foods consumed by most of the households is rice, corn, and wheat. Most people consume rice as the main staple food, and rice is generally prepared and consumed in the household. Fourteen years later, there was a fundamental change in spending patterns. The share of expenditure on processed food has been increasing significantly. This was implying that the expenditure on rice consumed away from home has also been increasing accordingly (Ariani and Hermanto 2015).

Cooking pattern change might closely associate with the fact that the number of women who work had been increasing from year to year. The BPS (2007) stated that the increase in female labour force participation during February 2006-February 2007 reached 2.12 million persons. They were mainly working in agriculture and trade sectors and, at the same time, increasing participation for men only 287 thousand. The increasing number of women workers would consequently reduce the time available to prepare food at home.

With the dynamic change of rice consumption in Indonesia, it is important to calculate a more realistic quantity of rice consumption in Indonesia. Disregarding the quantity of rice consumed away from home will lead to unreliable measures of national rice consumption in Indonesia. It is also important to understand how rice consumption patterns are changing for different segments of the population, e.g., various income classes, to make more informed estimates of changes in future demand. Aggregate national data on rice production, even if accurate, can shed no light on this issue. Thus, it is essential to examine data from household surveys.

We must understand better how rapidly this shift is occurring and how food eaten outside the home differs (if at all) from food eaten at home. Fortunately, the National Socio-Economic Survey (Susenas) contains information on food consumed away from home in terms of expenditures (not quantities). Because the data collected are in local currency terms, national statistical institutes, namely BPS of Indonesia, do not incorporate them into published estimates of the quantity of consumption.

Be aware of problems in estimating rice consumption that is more realistic at the national level. This research aims to analyze: (1) the trends in quantity in terms of weight and expenditure for consumption at home for different income quintiles and different locations (rural vs. urban); and (2) the trends of food bought away from home for different income quintiles and different locations (rural vs. urban).

METHODOLOGY

Data

National Survey on Socio-economic (Susenas) is a household level survey conducted by The National Agency for Statistics (BPS). Variables on consumption/expenditure modules are collected every three years. The following description is focused on the module consumption/expenditure following the needs of data analysis, namely, 1996, 1999, 2002, 2005, 2008, 2011, 2014, and 2017 to explain the share of expenditure for food away from home.

The sample size for the Susenas consumption/expenditure modules is about 75 thousand households, which are scattered throughout Indonesia, and it can be distinguished by the type of area (urban and rural). However, samples for consumption/expenditure modules for Susenas 2011 and Susenas 2014 reached about 300,000 households, and the data collection was conducted quarterly (March, June, September, December). The sample frame and sampling phase of households for Susenas, 1996, 1999, 2002, 2005, 2008, 2011, and 2014 followed the methodology conducted by BPS.

The definition of food consumed away from home (FAFH) were the food and (beverages)

consumed by households arising from the purchase or provision, not the result of processing/cooking at home (Saksena, 2018). The concept is consistent with the one used in this study was "Food Eaten Away From Home" (FAFH). Meanwhile, the other 12 food groups, excluding tobacco and betel, which were processed at home, and then consumed by the households were called "Food Eaten at Home" (FH).

The time reference for food consumption data collection was during one previous week. The data on food consumption was estimated by measuring the quantity of food consumption and the price of food without concerning the origin of the food as well as the utilization of food. To guaranty the quality of data collection, BPS has screened the collected data for outliers. The household with daily per capita calorie consumption less than 1000 Calories or more than 4500 calories, will be considered as outliers and removed from further data processing.

Method of Analysis

Conversion of Rice from Many Forms of Rice Product

In Susenas questionnaires, in addition to rice, there were glutinous rice and other rice-based processed food, namely rice flour and rice noodle or other processed foods containing rice. Conversions were used to calculate the quantity of rice from processed foods rice and processed foods into primary forms (rice) obtained from the Center for Food and Nutrition Policy Studies (PSKPG), Bogor Agricultural University (IPB),

which was in the publication of Directory on Food Consumption Improvement, Agency for National Food Security, the Ministry of Agriculture, 2016.

In the Susenas questionnaire, there are many kinds of processed food containing rice. Still, in this analysis, only four food consumed away from home (FAFH) with a high content of rice, namely mixed rice (a plate of rice accompanied by many dishes), fried rice, white rice (steamed rice) and wrapped rice with mixed vegetable (the boiled rice is wrapped by banana leaf or coconut leaf). These conversions were presented in Table 1.

The units measured in the questionnaire for the four types of processed food are a portion of food. One portion of food was converted to the weight equivalent of rice by using a conversion factor. The conversion factor of weight used for each type of food is 0.1, with the assumption that the average person consumes rice about 3 ounces a day and to be consumed three times a day. Conversion factors of processed food containing rice to rice equivalent were presented in Table 2.

Estimating the Quantity of Rice Consumed Away from Home

Food away from home is becoming increasingly important over time, and that it is very important now for a large number of people. The quantity of food consumed away from home can be estimated by using the following formulas (Hermanto et al. 2016):

$$\frac{e_{RH}}{e_{FH}} = \delta \frac{e_{RAFH}}{e_{FAFH}}$$

Table 1. Conversions used for glutinous rice, rice flour, and rice noodle

No.	Food Type	Conversion into rice form
1	Glutinous rice	1.00
2	Rice flour	1.01
3	Rice noodle	1.00

Source: PSKPG–IPB (2016)

Table 2. Conversion factors of processed food containing rice to rice equivalent

No.	Type of FAFH	Conversion into rice fForm
1.	Mixed rice	0.50
2.	Fried rice	0.50
3.	White rice	0.50
4.	Wrapped rice with mixed vegetable	0.25

Source: PSKPG-IPB (2016)

It was assumed that the share of rice in expenditures on food at home (FH) is equal to the share of rice in expenditures on food away from home (FAFH) times a constant factor δ. Most likely, δ is greater than or equal to one, if the share of rice in expenditures on FH is greater than the share of rice in expenditures on FAFH (people eat fancier foods away from home). Where *e* is expenditures, R is rice, F indicates food, H indicates home, and AFH indicates away from home. The δ would most likely vary from one quintile to another, and between urban and rural areas.

Also note that there is a conceptual problem here in even defining the share of rice in expenditures on FAFH, as street vendors and restaurants don't always allow customers to split out different ingredients and pay for each separately. Thus, it is not possible to allocate expenditures across rice, meat, and vegetables. Even if the vendor does sell a cup of rice separately for a specific price, it is not clear how the vendor is allocating his/her labour costs and fixed capital overhead across different food items.

Rearranging gives

$$e_{RAFH} = \frac{1}{\delta} \frac{e_{RH}}{e_{FH}} * e_{FAFH}$$

By definition, e = PQ.

Therefore, the equation becomes:

$$P_{RAFH} * Q_{RAFH} = \frac{1}{\delta} P_{RH} * Q_{RH} * \frac{e_{FAFH}}{e_{FH}}$$

Now assume that the ratio of the price of rice bought for home consumption (i.e., the retail price) to the price of rice bought as part of meals away from home is γ. This leads to:

$$Q_{RAFH} = \frac{\gamma}{\delta} * Q_{RH} * \frac{e_{FAFH}}{e_{FH}}$$

In this study, the value of γ/δ will be simulated in such a way that the value of Q_{RAFH} has the closest value compared to the value of the quantity of rice consumed away from home obtained from the conversion methods as described previously.

Technique on Real Expenditure Calculation

There are seven points of Susenas data, which are analyzed in this research, i.e., 1996, 1999, 2002, 2005, 2008, 2011, and 2014. The value of food consumption expenditure across time could not be compared in nominal terms, considering the inflation factor, which differs across the time. To minimize the inflation effects, it was necessary to calculate the real value by dividing the nominal value of the price index figures as a deflator. Differences in the use of the base year for the CPI calculation should be taken into account when analyzing the data in a long period of time. If the CPI as the deflator used for data analysis over the period 1996-2014, the CPI base year had to be the same prior to the analysis. In this study, the CPI, which would be the deflator, was calculated using the base year 2012 (2012 = 100). The results of the CPI calculation with the base year 2012 were presented in Table 3.

RESULTS AND DISCUSSION

Expenditures on Food Away from Home Consumptions

In general, a household's needs could be grouped into two major groups, namely food, and non-food needs. At a certain income level, households would allocate their income to meet their needs, the household expenditure used as a proxy of the household's income level (BPS, 2013). Therefore, household expenditure patterns could be used as one of the variables to measure the welfare (economic) of the population.

Food expenditure could generally be divided into two groups, namely expenditure for processed food and for food consumed at home, and the other group was food expenditure for purchasing processed food away from home (FAFH). The higher proportion of food expenditure for purchasing FAFH as compared to expenditure for processed food and food consumed at home indicated that household members spent more time for activities outside the household so that they have limited time available for cooking meals at home. This condition was mostly experienced by households whose wives working outside the household. The phenomenon was more commonly found in urban areas. Providing economic demands was likely to increase so that it encouraged women to take apart more actively in income-earning activities outside the household. Therefore, time to provide food at home was limited, and there was a tendency to buy processed FAFH.

To identify the dynamics of food expenditures, the real food expenditures variable is applied so that the bias of food price increase due to inflation

Table 3. Stages calculate consumer price index with base year equating

Year	Step-1		Step-2		Step-3		Step-4		Step-5	
	CPI	Base year	CPI	Base year	CPI	Base year	CPI	Base year	CPI	Base year
1996	185.92	1988/1989	100	1996	38.12	2002	25.32	2007	19.05	2012
1997	198.22	1988/1989	106.62	1996	40.64	2002	27.00	2007	20.31	2012
1998	168.32	1996	168.32	1996	64.17	2002	42.62	2007	32.07	2012
1999	202.79	1996	202.79	1996	77.31	2002	51.35	2007	38.64	2012
2000	210.27	1996	210.27	1996	80.16	2002	53.25	2007	40.06	2012
2001	234.46	1996	234.46	1996	89.38	2002	59.37	2007	44.67	2012
2002	262.31	1996	262.31	1996	100.00	2002	66.42	2007	49.98	2012
2003	279.59	1996	279.59	1996	106.59	2002	70.80	2007	53.27	2012
2004	113.25	2002	113.25	2002	113.25	2002	75.22	2007	56.60	2012
2005	125.09	2002	125.09	2002	125.09	2002	83.09	2007	62.52	2012
2006	141.48	2002	141.48	2002	141.48	2002	93.98	2007	70.71	2012
2007	150.55	2002	150.55	2002	150.55	2002	100.00	2007	75.24	2012
2008	110.98	2007	110.98	2007	110.98	2007	110.98	2007	83.51	2012
2009	115.06	2007	115.06	2007	115.06	2007	115.06	2007	86.58	2012
2010	120.97	2007	120.97	2007	120.97	2007	120.97	2007	91.02	2012
2011	127.45	2007	127.45	2007	127.45	2007	127.45	2007	95.90	2012
2012	132.90	2007	132.90	2007	132.90	2007	132.90	2007	100.00	2012
2013	142.18	2007	142.18	2007	142.18	2007	142.18	2007	106.98	2012
2014	113.22	2012	113.22	2012	113.22	2012	113.22	2012	113.22	2012

Source: BPS

Note: Refer to Table 3, there were five stages in calculating the CPI with the same base year (2012 = 100). Stage 1: collecting data in accordance with CPI base year published by the BPS. Next on stage 2: the CPI with base year 1988/1989 was equated into the base year 1996 (1996 = 100). Stage 3: the CPI base year 1996 was equated into the CPI base year of 2002 (2002 = 100). Stage 4: the CPI base year 2002 was equated into the base year 2007 (2007 = 100). Phase-5: equated all CPI into the base year 2012 (2012 = 100). Finally, the CPI figures (2012 = 100), which was in accordance with the time point of analysis (1996, 1999, 2002, 2005, 2008, 2011, and 2014), were taken as the deflators to calculate the real expenditure values.

can be minimized. In the analysis, households in urban and rural areas were respectively grouped into five quintiles (Q1-Q5), according to Amount of household's income. Each quintile was composed of 20% of the household samples. Variable Q1 described 20% of households with the lowest expenditure level, while Q5 described 20% of households with the highest expenditure level. The dynamics of expenditure on processed FAFH of each income class in urban areas during the period 1996-2014 were presented in Figure 1.

Referring to Figure 1, in general, FAFH in urban areas during 1996-2014 was likely increasing for all income groups. For Q5, the highest income group, the real process of food expenditure surged more than the other income groups. One interesting occurrence in Figure 1 was that the FAFH expenditure for income group Q3, Q4, and Q5 in urban areas declined during the period 2005-2008 and then increased again. The declined expenditures might be related to food price increase during 2005-2008, which was one of the triggers of the monetary crisis during 2007/2008 and led to an increase in other goods prices. The food price increase, including processed FAFH, had an impact on the Q3 income, that its expenditure allocation for processed FAFH decreased. In terms of quantity of FAFH consumption for the income group Q4 and Q5, actually, it increased for respectively 11.89% and 6.20% during the period 2005-2008. However, in terms of the expenditure value, both groups experienced a decline. No data support

exactly this phenomenon, and it might be the kind of sources of location the food they bought was different (restaurant versus street food vendors).

In rural areas, the dynamics of FAFH consumption pattern during the period 1996-2014 was similar to urban areas (Figure 2). In general, FAFH expenditures had a tendency to increase during the period 1996-2014. The increasing participation rate of women on earning income activities in rural areas and limited time allocation for preparing food at home was one of a trigger the increasing expenditure of FAFH. For rural areas, the food price increase in 2005 and the financial crisis of 2008 gave an impact only on Q4 and Q5 income group households, that was, FAFH expenditure decrease during the period 2005-2008, and then in the following years, it was likely to increase again.

In lower-income groups (Q1 and Q2), the curve looked coinciding, and it meant that the amount of FAFH expenditure during the period 1996 to 2014 was almost the same at any point of the time. For high-income group households (Q5), the increasing pattern looked sharper in the FAFH expenditure, despite a decline during the period of 2005-2008.

The average annual growth of real FAFH expenditure in urban and rural areas during the period 1996-2014 is presented in Figure 3. The data showed that the real FAFH expenditure growth in urban areas was much faster than in rural areas for all income groups, except the income group Q2. It indicated that urban area households had a tendency to have more limited time for preparing food at home (FH). Some influencing factors were among others: (1) many women or housewives in urban areas worked outside the household so that their time available to prepare food at home were declining, (2) more diverse and easily accessed FAFH availability, which was sold at food stalls/restaurants in urban areas, (3) a consequence of open information technology as a promotion medium for ready-to-eat food and it facilitated consumers to buy FAFH, (4) for households, whose members only of 2-3 persons, sometimes it was easier to buy FAFH rather than cooked food at home.

During the period 1996-2014 in urban areas, the growth of FAFH real expenditure for lower-income groups (Q1) was the fastest as compared to other income groups. Increasing regional minimum wage regularly it might be triggered this phenomenon. The slowest growth was at the Q2 income group, while the Q3 income group was relatively slower than Q1. In rural areas, the fastest growth of FAFH expenditure during the period of 1996-2014 was for Q1 household
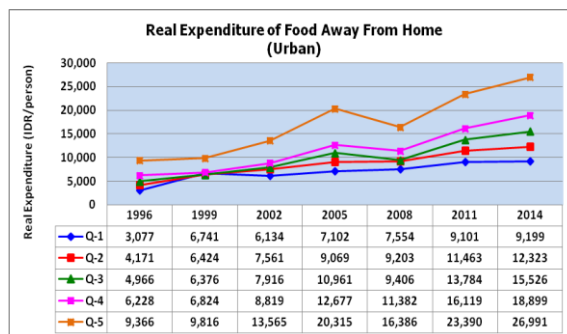

Figure 1. Real expenditure of food away from home in urban areas
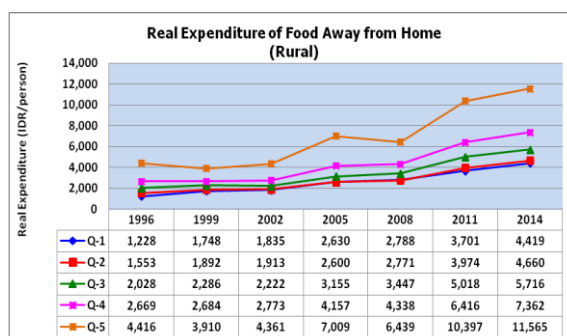

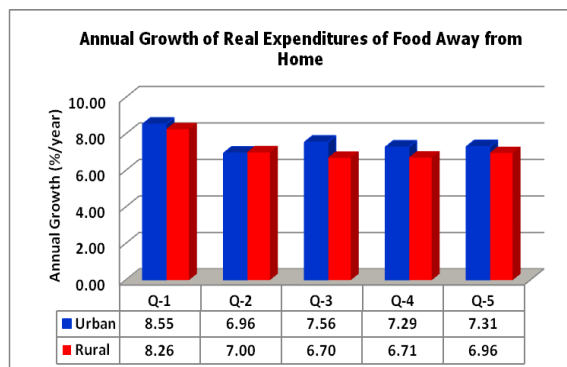Figure 2. Real expenditure of food away from home in rural areas

Figure 3. Annual growth of real expenditures of food away from home

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

income groups, which was equal to 8.26%/year. While the growth of FAFH expenditure of income group Q2 was slower than Q1. The growth of FAFH expenditures of lower-income groups was faster than that of higher-income groups' (Figure 3).

Susenas data 2017 shows the proportion of food expenditure for FAFH (as prepared foods and beverages) is the highest portion for Indonesian household expenditure in urban and rural areas, namely 38% and 26%, respectively (Figure 4 and Figure 5). A recent study done by Dawe et al. (2019) found the same directions they

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AWAY FROM HOME   *Handewi P. Saliem, Hermanto, Erma Suryani, Rita Nur Suhaeti, Mewa Ariani*
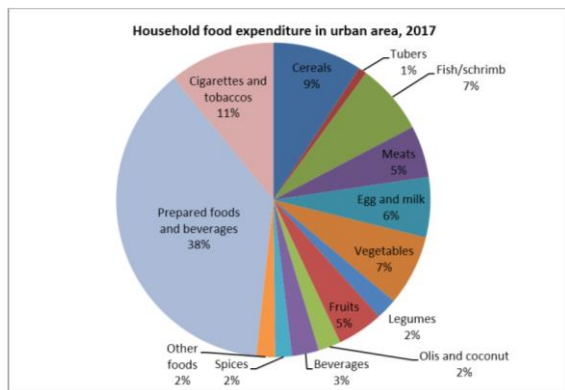
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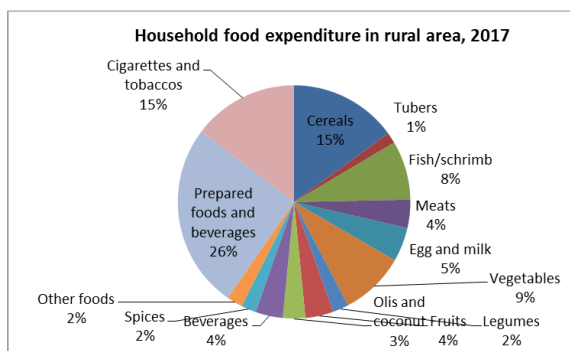Figure 4. Household food expenditure in an urban area, 2017

Figure 5. Household food expenditure in a rural area, 2017

Source: Susenas, BPS (2017)

found in Asia that food prepared away from home becomes progressively more important. This implies, for a healthy side, foods as consumed way from home (FAFH) should contain high nutritious values, safe, and reasonable prices. A previous study done by Todd (2017) reported that FAFH is a significant source of energy, fat, and cholesterol among working-age adults in the USA. Bezerra et al. (2013) in Brazil found that foods consumed away from home were a predominance of high energy and poor nutritional content while a study done by Islam et al. (2010) showed that FAFH expenditures by Malaysian households were income inelastic.

Total Food Expenditures for Home Consumption

The dynamic pattern of growth in real expenditure for food consumed at home during the period 1996-2014 was presented in Figure 6. The curve in Figure 6. shows a pattern of real expenditures for food consumption at home for urban areas during the period 1996-2014, which was almost the same for households across all income groups. During the period 1996-2002, the real food expenditure consumed at home increased then decreased during the period

2002-2008 and increased again during 2008-2014. The decline in real food expenditure for home consumption during the period 2002-2008 has a correlation with the fuel price increase for 16.67% in 2003 and the world's food price increase in 2005 that had an impact on increasing food prices in Indonesia. The condition was aggravated by Indonesia's monetary crisis in 2008 that resulted in a high inflation rate. Following 2008, the economic condition was getting better, and consumption patterns for all income groups increased.

If households among income groups in urban areas were compared as presented in Figure 6, it was shown that the order of real food expenditure for home consumption levels was consistent with the order of the income group levels, meaning that the income group Q5 got the highest value of real food expenditure, followed by Q4, Q3, Q2, and Q1. This pattern occurred for all of the periods.

The pattern of real food expenditure for home consumption patterns in rural areas during the period 1996-2014 was slightly different from the pattern in urban areas, which generally had a tendency to increase, but there was a decrease during the period 2002-2008 for groups Q1 to Q4 (Figure 7). While households belonged to income group Q5, the real food expenditure for home consumption continued to increase during 2002-2005. The condition indicated that the fuel price increase in 2003, which led to an increase in food prices gave no impact on the income group Q5. The decrease of real food expenditure for home consumption on the household of the Q5 income group only occurred during the period 2005-2008.

According to the data in Figure 7, the increase in expenditure during the period 2008-2011 increased sharply across all income groups. It was estimated that there was an influence of a significant decrease in fuel prices decrease in 2009, where the gasoline price was previous IDR 6,000/liter then down to IDR 4,500/liter. This condition affected the declining prices, including food prices, through declining transportation costs.

If there was a comparison among households' income groups in rural areas, the pattern would be the same as in urban areas. Figure 5 showed that the amount of real food expenditure for home consumption followed the order of income group. In other words, the real food expenditure for home consumption for the Q1 income group was the smallest, and the Q5 income group was the highest. The pattern occurred at all-time points during the period 1996-2014.

The average annual growth of real food expenditures for home consumption during the period 1996-2014 urban and rural areas was presented in Figure 8. In general, the growth in real food expenditures for home consumption increased both in urban and rural areas. Real food expenditures for home consumption in rural areas were much higher than in urban areas. In contrast to the growth of real FAFH in urban areas was higher than in rural areas. This condition proved that for urban areas where
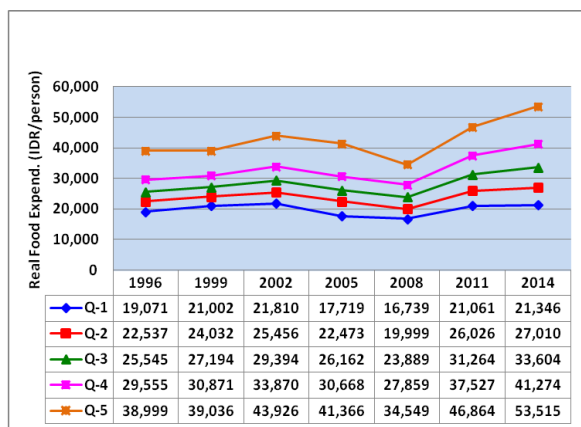

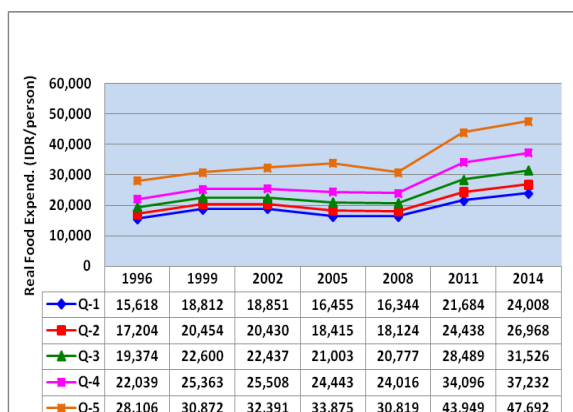Figure 6. Real expenditure of food from home in urban areas

	1996	1999	2002	2005	2008	2011	2014
Q-1	19,071	21,002	21,810	17,719	16,739	21,061	21,346
Q-2	22,537	24,032	25,456	22,473	19,999	26,026	27,010
Q-3	25,545	27,194	29,394	26,162	23,889	31,264	33,604
Q-4	29,555	30,871	33,870	30,668	27,859	37,527	41,274
Q-5	38,999	39,036	43,926	41,366	34,549	46,864	53,515

Figure 7. Real expenditure of food from home in rural areas

	1996	1999	2002	2005	2008	2011	2014
Q-1	15,618	18,812	18,851	16,455	16,344	21,684	24,008
Q-2	17,204	20,454	20,430	18,415	18,124	24,438	26,968
Q-3	19,374	22,600	22,437	21,003	20,777	28,489	31,526
Q-4	22,039	25,363	25,508	24,443	24,016	34,096	37,232
Q-5	28,106	30,872	32,391	33,875	30,819	43,949	47,692
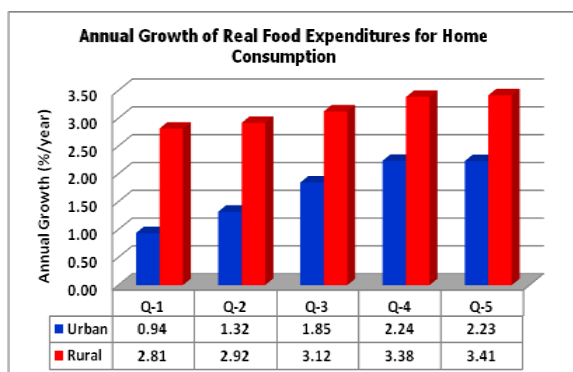
Figure 8. The annual growth of expenditure on food home consumption

	Q-1	Q-2	Q-3	Q-4	Q-5
Urban	0.94	1.32	1.85	2.24	2.23
Rural	2.81	2.92	3.12	3.38	3.41

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

people (including women) got a lot of work away from home and had a tendency to consume more. FAFH. While for rural areas where generally women do not work outside, they had enough time to cook meals at home for their families. Therefore the FAFH expenditure was lower than in urban areas (Figure 8).

Total Expenditures

According to the concept, total household expenditure was the sum of food and non-food expenditures. Generally, knowledge of household expenditure was used as an indicator to describe the household income level, because measurement and data collection on income was a lot more difficult. To compare the expenditure value for 18 years during the period of 1996-2014, a calculation on the real value of the expenditures was required to minimize the inflation effects.

Household's expenditure composition could be applied as a measure to assess the economic welfare level of the population. Engel's Law stated that the percentage of food expenditure would decrease along with increasing income if it was assumed that preference or taste was the same. Therefore, the lower the percentage of food expenditure to total expenditure, the better the economic condition level of the population. Conversely, the greater the share of food expenditure, the less welfare level of concerned households. Suryani et al. (2016) found that during 2002 – 2014, the percentage of food expenditure for Indonesian households in urban and rural areas was decreased along with increasing income, this implies that Engel's Law was applied in Indonesia.

The pattern of urban household's total expenditure during the period 1996-2014 was generally increasing (Figure 9). Households belonged to income groups Q1 up to Q4 got an almost coinciding in the total real expenditure growth curve. It indicated that the difference in the value of real spending among income groups was relatively not much different. However, the expenditure of income group Q5 fluctuated. It declined during the period 1996 - 1999 and 2005 - 2008, and then after 2008, the expenditure curve increased sharply. It seems that economic recovery from the crisis 2007/2008 was boosted the household expenditure pattern in Indonesia.

The pattern of growth in total real expenditure in rural areas during the period 1996-2014 was presented in Figure 8. In general, the dynamic of total real expenditures showed an increase for all income groups. During the period 1996 – 2008,

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there was a relatively slow increase in the total real expenditure for households belonged to the Q5 income group. However, during 2008 - 2014, the real expenditure increased quite sharply. The magnitude of the real expenditure of households belonged to the Q5 income group was almost doubled as compared to the Q4 income group.

The dynamics of the average growth in total real expenditures during the period 1996-2014 by region was presented in Figure 11. The growth rate in urban areas had a tendency to increase along with income groups, the highest income groups, Q5, had the highest average growth of total real expenditure of 3.56%/year, while the lowest income groups Q1 was 2.33%/year.

The dynamics growth pattern in rural areas was a bit different than in urban areas, where the growth rate was not in line with the income groups. The household income groups Q5 had the lowest growth rate (3.49%/year) among all income groups, even it was almost equal to the growth rate in the lowest income group Q1. If the growth rate of total real expenditures were compared among regions, it seemed that the growth in rural areas for the income groups Q1 up to Q4 in an urban area was higher than in rural areas. However, the growth for the total real expenditure of the income group Q5 was slightly higher in urban areas than in rural areas).

Rice Expenditures for Home Consumptions

Expenditure on rice consumed at home for urban households showed a fluctuating pattern for all income groups. In this case, the average expenditure in real rice expenditure (already deflated by the CPI) had increased during the period 1996-1999 and 2008-2011 for all income groups. Meanwhile, during the period 1999 - 2002 - 2008, there was a decline in real rice expenditures consumed at home. A slightly different pattern occurred during the period 2011 - 2014, rice expenditure of households belonged to Q1 and Q2 (lower income groups) had decreased. In contrast, the average rice expenditure of households belonged to Q4 and Q5 (middle and high-income groups) at the same time had increased (Figure 12.). The increase of rice expenditure for the Q4 and Q5 groups in urban areas was estimated to have something to do with better rice quality (with higher prices) as compared to the rice quality consumed by households belonged to lower-income groups.

The household's rice expenditure patterns were consistent with income groups. In this case, the higher the income, the higher the rice

expenditure (for 1999, 2005, 2011 and 2014). However, for 1996, 2002, and 2008 it showed inconsistent patterns among income groups. Non-rice food availability and easier access in urban areas allowed households to consume non-rice food, which resulted in reduced expenditure on rice. However, there were differences in access and response for each household income group causing inconsistent expenditure patterns in 1996, 2002, and 2008.
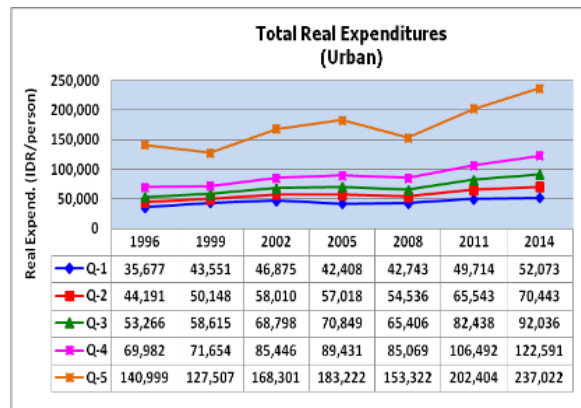

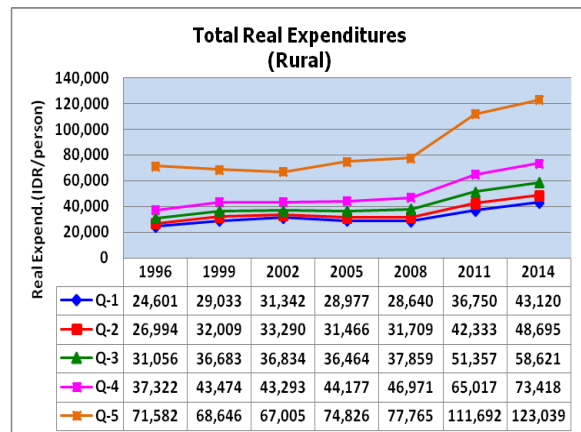Figure 9. Total real expenditures in urban areas

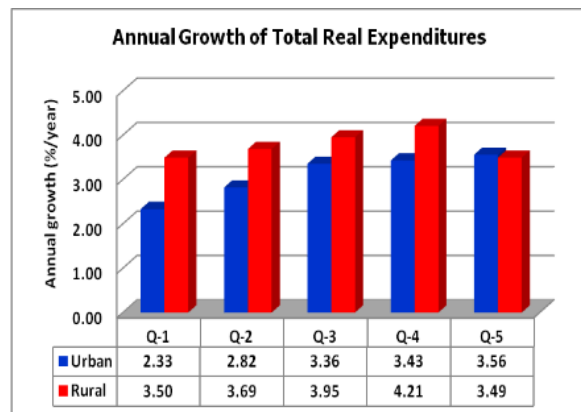Figure 10. Total real expenditures in rural areas

Figure 11. The annual growth of total real expenditures

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

The different performances took place in rural areas, as showed by the data in Figure 13. At all-time points, the higher the income, the higher the average price expenditure. In addition, the patterns were also seen consistent during 1996 - 1999, 2008 - 2011, and 2011 – 2014, that there were increases in rice expenditure of rural households in all income groups. The decline in rice expenditure occurred during 1999 - 2002, 2002 - 2005 and 2005-2008.

The higher the household income levels, the higher the average growth rate of rice expenditure (Figure 14). This phenomenon occurred both in urban and rural areas. The annual growth of rice expenditure of the lowest income groups in urban areas was 0.16%, while the highest income group had increased with the annual growth rate of 2.4%. Data in Figure 12 showed that the growth rate for average rice expenditure on households in rural areas was higher than in urban areas and consistent all income groups.

In general, the expenditure pattern of glutinous rice consumption in urban areas was the higher the income level, the higher the expenditure on glutinous rice consumption. However, there was an exception that the expenditure of glutinous rice consumption in 1999 for the income groups Q3 up to Q4 decreased, and in 2014 the decline occurred for the group income Q1 and Q2 (Figure 15). The glutinous rice was generally consumed as snacking food. The expenditure pattern of glutinous rice consumption for rural households showed a similar pattern to urban areas (Figure 16). In general, the expenditure for the glutinous rice in rural households was higher than the expenditure for the glutinous rice households in urban areas.

Figure 15 showed the data on household expenditures on glutinous rice consumption growth. In general, the growth rate of household's expenditure for glutinous rice of each income group in urban areas was higher than in rural areas, except for households with income group Q4. The highest average annual growth rate for the glutinous rice expenditure was in group Q1 in urban areas that were up to 18%/year during the period 1996 - 2014. In the same periods of time, the lowest average annual growth rate for the glutinous rice expenditure occurred in the highest incomes (Q5) group in rural areas with the rate of decline by 0.26%/year.

Data in Figure 18 presented the average expenditure patterns for rice flour urban households of Indonesia by income group from 1996 - 2014. Among income groups for each year, it appeared that the higher the income levels, the higher the rice flour expenditure. If it was viewed over time, all income groups showed a consistent pattern, namely a decline in expenditure for rice flour during 1996 - 1999; 2008 - 2011 and 2011 - 2014, whereas in the time period 1999 - 2002, 2002 - 2005 and 2005 -2008 showed an increase of rice flour expenditure for
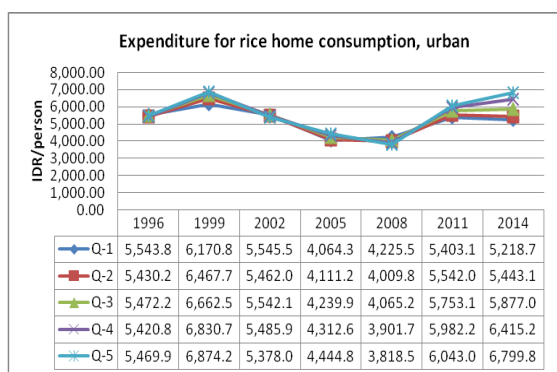

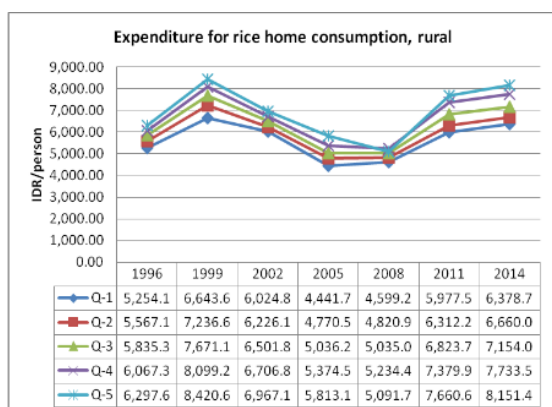Figure 12.   Real expenditure of food from home in urban areas

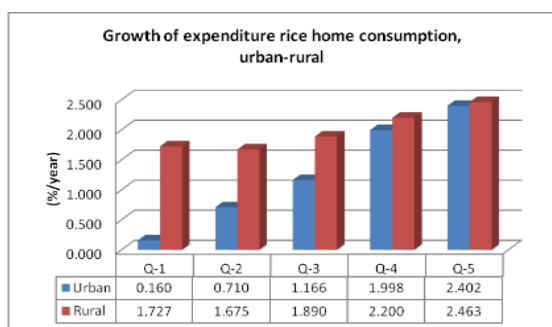Figure 13.   Real expenditure of food from home in rural areas

Figure 14.   Growth of expenditure rice home consumption, urban-rural

Notes: *) Mean of deflated expenditure values

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

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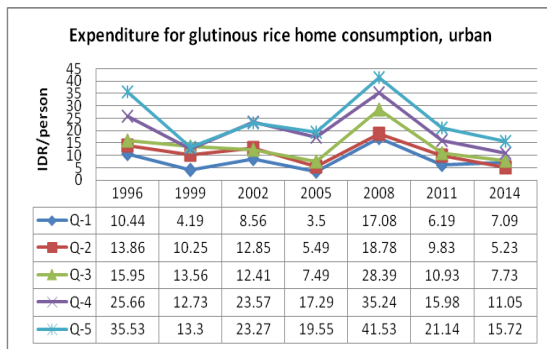
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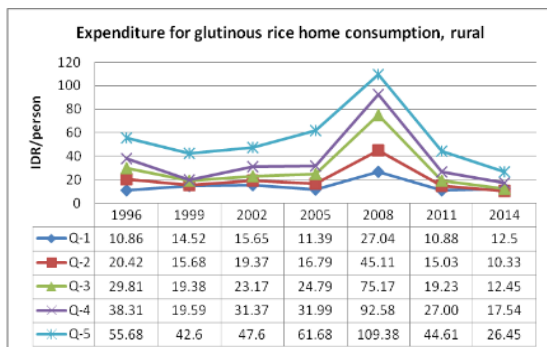Figure 15. Expenditure for glutinous rice in urban areas

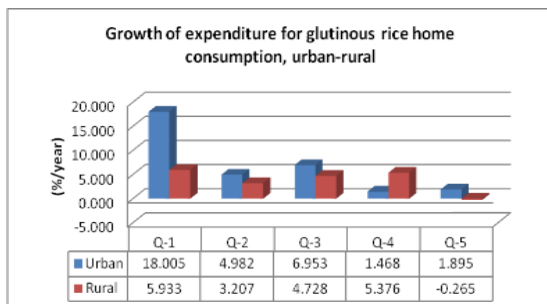Figure 16. Expenditure for glutinous rice in rural areas

Figure 17. Growth of expenditure for glutinous rice

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

urban households. The significant rice flour expenditure increase occurred during the period 2005 - 2008. As it was known, that in 2007, Indonesia experienced an economic crisis, which resulted in food prices soar. The increasing rice flour expenditure in urban area households was one of the economic crisis impacts.

The pattern of household expenditure for rice flour in rural Indonesia in 1996 - 2014 was presented in Figure 19. There was the higher the income, the higher was the expenditure for rice flour. In addition, when it was viewed over time, a similar pattern of expenditure also occurred during the period 1999 - 2002, 2002 - 2005, 2005 - 2008 with a significant increase in the period 2005 - 2008 while the decline in household's

expenditure for rice flour in rural areas took place during 1996 - 1999 and 2011-2014.

Data in Figure 18 showed an annual growth rate of rice flour expenditure for urban and rural households in Indonesia by income group. It seemed that there was a pattern that the growth rate of household's expenditure on rice flour at all income groups in urban areas was higher than in rural areas (except for households with income group Q5). A very high growth rate occurred for households with the lowest incomes (Q1) in urban areas, which reached more than 350%/year.
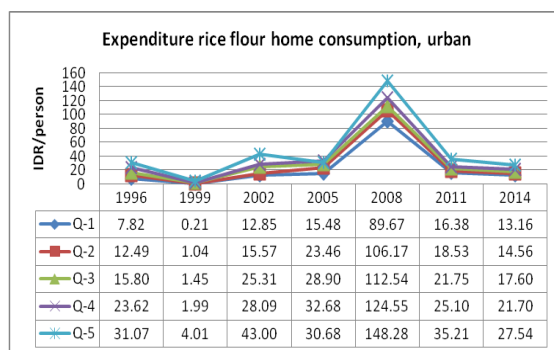

Figure 18.   Expenditure for flour rice home consumption in urban areas
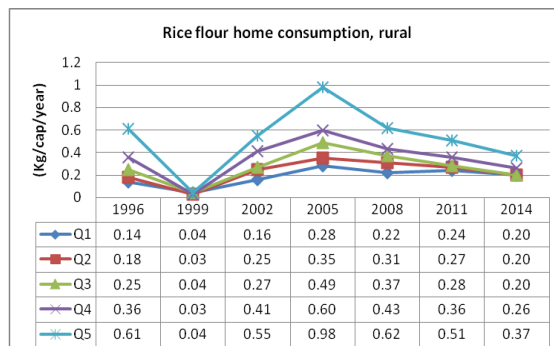

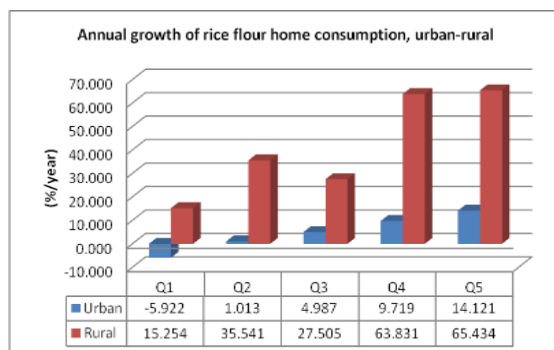Figure 19.   Expenditure for flour rice home consumption in rural areas

Figure 20.   Annual growth of expenditure for flour rice consumption

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

Figure 21 showed the data on rice noodle expenditure patterns in urban households of Indonesia from 1996-2014 by income group. The pattern was quite consistent that a household's expenditure on rice noodles increased along with growing incomes, except in households with the lowest incomes (Q1 and Q2) in 1999. In general, there was an increase in rice noodle expenditure during the period 1996 - 2005, with the highest expenditure peak that occurred in 2005.

The higher the income, the more increasing expenditures for rice noodles, this was indicated by the growing value of average rice noodle expenditure on the higher income groups in rural areas (Figure 22). If rice noodle expenditure in urban areas was compared to rural areas, it would show that households in urban areas in average allocated the income for rice noodle higher than households in rural areas (Figure 21 and Figure 22). As it occurred to an urban pattern, household expenditure on rice noodles in rural areas, in general, continued to decline although a significant increase took place in 2005.

It was interesting to observe Figure 23, showing an annual growth rate of household expenditure on rice noodles by income groups in urban and rural areas of Indonesia. All income groups showed consistent figures that households in rural areas had a higher growth rate of rice noodle expenditure than that in urban areas.

Rice for Home Consumption

Rice is the staple food for most Indonesians. It was proven from rice consumption patterns, which the average amount of household rice consumption generally was not much affected by economic conditions (with or without the existence of economic crisis or food crisis). This was in contrast to the pattern of rice expenditure, which significantly fluctuated as a result of the economic crisis or a food crisis. Figure 24 showed data on rice consumption patterns of urban households in Indonesia by income groups from 1996 - 2014.

If viewed over time, it showed a consistent pattern that the average amount of rice consumption per capita for households in urban areas of Indonesia had decreased and occurred at all income groups. Additionally, among income groups, the higher the level of income, the smaller the rice consumption per capita.

In rural areas, the consumption of rice increased along with increasing income (Figure

23). However, there were similarities between the time of rice consumption patterns for households in urban and rural areas; in this case, all income groups showed a decreased level of rice consumption.

The level of rice consumption in urban and rural areas along time showed a decline. It was also reflected by the negative growth rate for all income groups. However, if Figure 24 was further examined, the data showed that the annual growth rate of rice consumption declined for households in rural areas was slower than in urban areas. This was consistent for all income groups. This pattern indicated that the household in urban areas more responded to reduce rice consumption, but the growth rate of the increase in rice-based FAFH was higher. This was due to
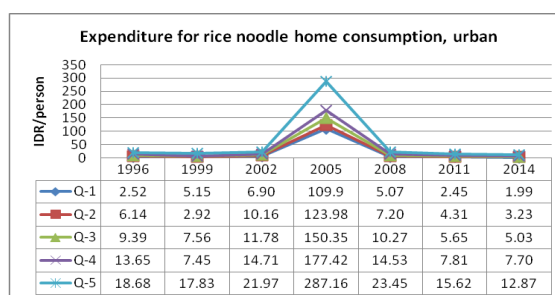

	1996	1999	2002	2005	2008	2011	2014
Q-1	2.52	5.15	6.90	109.9	5.07	2.45	1.99
Q-2	6.14	2.92	10.16	123.98	7.20	4.31	3.23
Q-3	9.39	7.56	11.78	150.35	10.27	5.65	5.03
Q-4	13.65	7.45	14.71	177.42	14.53	7.81	7.70
Q-5	18.68	17.83	21.97	287.16	23.45	15.62	12.87

Figure 21. Expenditure for rice noodle home consumption in urban areas

	1996	1999	2002	2005	2008	2011	2014
Q-1	2.52	2.36	2.16	85.43	1.5	1.3	1.02
Q-2	3.99	3.47	3.7	99.52	4.08	2.02	1.93
Q-3	4.83	3.86	5.26	104.42	5.33	2.66	2.57
Q-4	8.03	5.77	6.82	122.49	7.26	4.83	3.10
Q-5	13.12	9.78	10.22	184.81	13.42	8.84	6.43
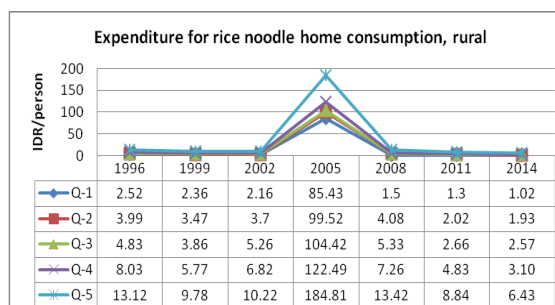
Figure 22. Expenditure for rice noodle home consumption in rural areas

	Q-1	Q-2	Q-3	Q-4	Q-5
Urban	81.403	64.244	59.084	56.593	60.161
Rural	205.953	135.138	97.388	84.596	85.179

Figure 23. Annual growth of expenditure for rice noodle home consumption

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

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more diverse rice-based FAFH availability and accessibility.

Changes in the Proportion of Food Eaten Away from Home Consumptions to Total Food Expenditures

In an open economic developing country, as in Indonesia, modernization occurs in almost all aspects of life, including the progress of modernization in the consumption patterns of its society. In accordance with the ever-increasing economic development in the region, more and more housewives have to get the jobs to provide additional income for their increasing household

Figure 24. Expenditure for rice home consumption in urban areas

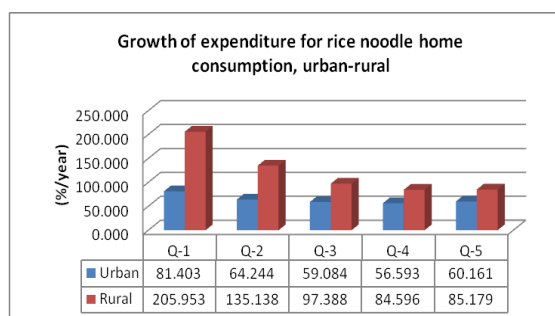|	1996	1999	2002	2005	2008	2011	2014
Q1	111.99	92.72	92.88	89.37	87.69	87.24	87.69
Q2	107.51	94.40	90.06	86.54	83.62	83.73	83.62
Q3	106.00	94.68	89.31	86.00	83.75	81.34	83.75
Q4	103.25	94.84	86.53	84.74	79.59	79.07	79.59
Q5	99.29	91.15	81.04	80.13	74.13	74.44	74.13

Figure 25. Expenditure for rice home consumption in rural areas

	1996	1999	2002	2005	2008	2011	2014
Q1	111.43	103.04	106.37	103.12	97.25	97.04	95.93
Q2	116.87	109.97	108.61	107.57	102.74	97.39	95.5
Q3	120.87	114.22	112.07	110.41	106.61	100.01	96.63
Q4	123.77	118.4	114.26	112.92	107.76	102.08	97.85
Q5	125.45	120.94	115.17	113.09	105.54	100.31	95.12

Figure 26. Annual growth of expenditure for rice home consumption

	Q1	Q2	Q3	Q4	Q5
Urban	-1.261	-1.337	-1.255	-1.392	-1.550
Rural	-0.800	-1.096	-1.215	-1.277	-1.499

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

needs. The available time for housewives to provide food at home, accordingly, tend to decrease over time. There were increasing numbers of housewives who buy processed food to be consumed at the working place and to be consumed at home. The cases happened with the head of households. With the increasing demand for their households' expenditures, the husbands also have to work farther away from the location of their homes, so they were also dependent on the consumption of processed foods purchased at the worksite. In that case, it is expected that the proportion of food consumed away from home will increase over time.

One way to measure whether there has been modernization in the consumption pattern of societies is to calculate the share of their expenditures on food consumed away from home (processed food) against total expenditures on food. The results of data analysis for Susenas 1996, 1999, 2002, 2005, 2008, 2011, and 2014 are listed in Figure 27. In general, the share of expenditures for food consumed away from home to the total expenditures for food tended to increase for the urban population. Thus we can say that the process of modernization of the consumption patterns for people living in urban areas has occurred. As expected, the highest share of expenditures for food consumed away from home to total expenditures of food occurred in the highest income group (Q5) of the population living in urban areas.

For the lowest income group (Q1), the share of expenditures for food consumed away from home to total expenditures of food in 1996 was 0.119. This figure increased sharply to 0.227 in 2005, then slightly increasing to 0.250 in 2014.

Similar to the consumption pattern of the population living in an urban area, the proportion of food consumed away from home to total food expenditure in rural generally tended to increase over time (Figure 28). The highest share of expenditures for food consumed away from home to total expenditures of food occurred in the highest income group (Q5) of the population living in rural areas.

The average annual growth rate of the share of expenditure on food consumed away from home for urban and rural regions can be seen in Figure 29. Data shows that the higher income group, the faster the annual growth of the share of expenditure consumed away from home for urban areas, as well as for rural areas. At every income group, the growth rate in urban areas tended to be faster than in rural areas. This situation implies that the rate of modernization of
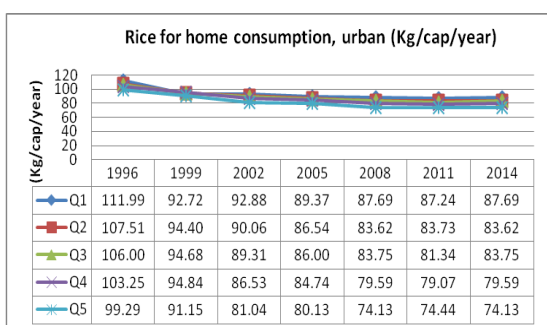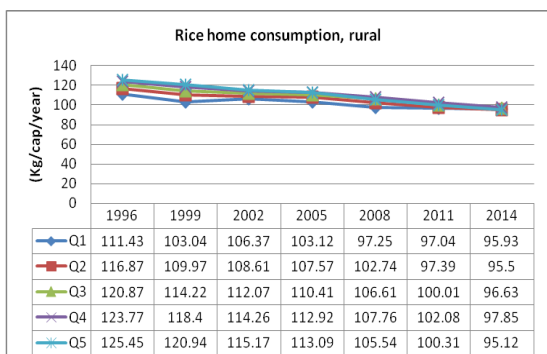
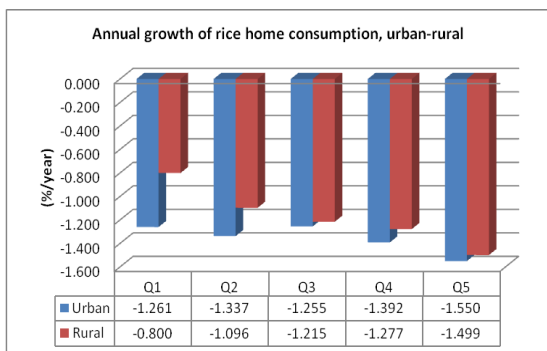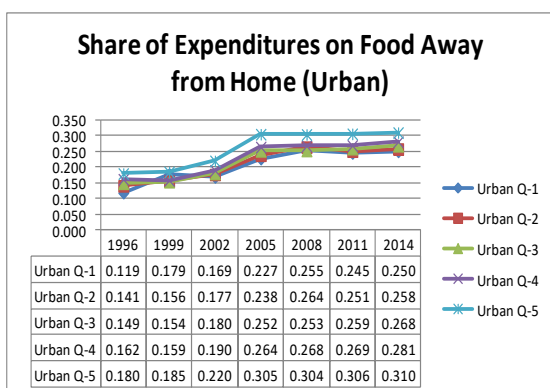Figure 27.   Share of expenditure on food away from home in urban areas

	1996	1999	2002	2005	2008	2011	2014
Urban Q-1	0.119	0.179	0.169	0.227	0.255	0.245	0.250
Urban Q-2	0.141	0.156	0.177	0.238	0.264	0.251	0.258
Urban Q-3	0.149	0.154	0.180	0.252	0.253	0.259	0.268
Urban Q-4	0.162	0.159	0.190	0.264	0.268	0.269	0.281
Urban Q-5	0.180	0.185	0.220	0.305	0.304	0.306	0.310
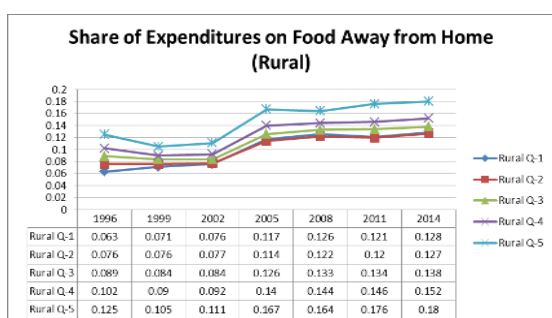
Figure 28. Share of expenditure on food away from home in rural areas

	1996	1999	2002	2005	2008	2011	2014
Rural Q-1	0.063	0.071	0.076	0.117	0.126	0.121	0.128
Rural Q-2	0.076	0.076	0.077	0.114	0.122	0.12	0.127
Rural Q 3	0.089	0.084	0.084	0.126	0.133	0.134	0.138
Rural Q-4	0.102	0.09	0.092	0.14	0.144	0.146	0.152
Rural Q-5	0.125	0.105	0.111	0.167	0.164	0.176	0.18

	Q-1	Q-2	Q-3	Q-4	Q-5
Urban	4.98	3.74	3.69	3.50	3.44
Rural	4.62	3.37	2.98	2.83	2.66

Figure 29. Annual growth of share expenditure on food away from home

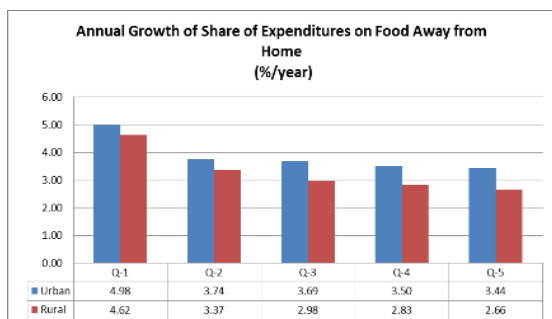Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

the food consumption pattern in urban areas was higher than in rural areas.

Estimation of the Quantity of Rice for Away from Home Consumption

Two methods in estimating the quantity of rice consumed away from home will be discussed in this chapter. The first method has been conducted using a direct conversion method (Center for Food and Nutrition Policy Studies 2016 and Southeast Asian Food & Agricultural Science and Technology (SEAFAST) Center

2016). In this method, the quantity of rice in a portion of food bought from food sellers has been estimated by using standard conversion factors. In this exercise, the quantity of rice consumed away from home denoted as QRAFH. The second method was using Dawe (2016) method as reported by Hermanto et al. (2016), where the quantity of rice consumed away from home has been estimated with the following mathematical formula: QRAFHS = (γ /δ)*(QRH)*(EFAFH/EFH).

The value of γ/δ can be simulated in such a way so that the quantity of QRAFHS became closer to the value of QRAFH. It turns out that the value of 0.1 and 0.05 has been used since the estimated QRAFHS with γ /δ = 0.1 and 0.05 has the closest value to the estimated values of QRAFH. Figure 28 is showing the dynamic value of QRAFH (red color), as well as, QRAFHS with γ /δ = 0.1 (blue color) and 0.05 (green color) for an urban area. There was a different pattern between the one for QRAFH and for QRAFHS. The QRAFH tended to decrease with the increase of income quintiles in a certain year. The pattern QRAFHS values (both for γ/δ = 0.1 and 0.05), on the contrary, were tended to form a U shape curve with the increasing of income quintiles.

The values of QRAFH for the urban area were ranging from 0.57 kg/capita/year in the Q3 in the year of 1996 to 3.93 kg/capita/year in the year 2008. Meanwhile, the values of QRAFHS with γ/δ = 0.1 for urban area Q1 were ranging from 1.81 kg/capita/year in the year of 1996 to 3.19 in the Q1 in the year of 2011. The values of QRAFHS with γ /δ = 0.05 for the urban area were ranging from 0.91 kg/capita/year in Q1 in the year of 1996 to 1.60 in the Q1 in the year of 2011.

Figure 31 is showing the dynamic value of QRAFH (red color), as well as QRAFHS with γ/δ = 0.1 (blue color) and 0.05 (green color) for a rural area. Similar to Figure 30, there was a different pattern between the pattern of QRAFH and the pattern of QRAFHS. The QRAFH tended to decrease with the increase of income quintiles in a certain year. The pattern QRAFH values (both for γ/δ = 0.1 and 0.05), on the contrary, were tended to increase with the increase of income quintiles.

The values of QRAFH for the rural area were ranging from 0.26 kg/capita/year in Q4 in the year of 1999 to 1.54 kg/capita/year in Q1 in the year of 2008. Meanwhile, the values of QRAFHS with γ/δ = 0.1 for the urban area were ranging from 0.88 kg/capita/year in Q1 in the year of 1999 to 2.00 in Q5 in the year of 1996. The values of QRAFHS with γ/δ = 0.05 for the urban area were ranging

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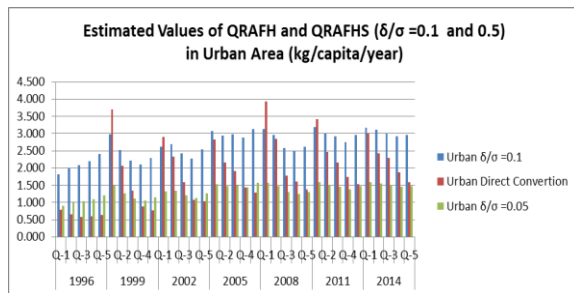
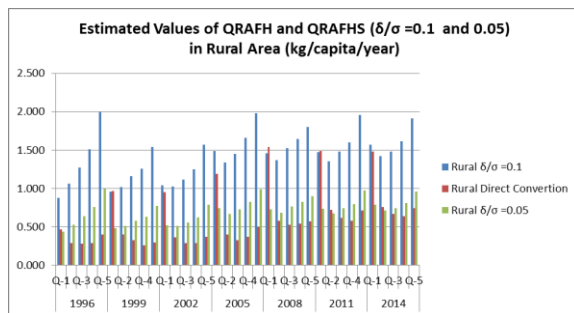Figure 30.   The pattern estimated values of QRAFH and QRAFHS (γ /δ = 0.1 and 0.05) in an urban area

Figure 31.   The Pattern Estimated Values of QRAFH and QRAFHS (γ/δ = 0.1 and 0.05) in a rural area

Source: Susenas, BPS (1996, 1999, 2002, 2005, 2008, 2011, and 2014)

from 0.44 kg/capita/year in Q1 in the year of 1996 to 1.00 in the Q5 in the year of 1996.

CONCLUSION AND POLICY IMPLICATION

Conclusion

The trend of real expenditure in Indonesia during the period of 1996 – 2014 was increasing. However, there has been a decreasing trend in real expenditures that occurred both in urban and rural areas, as well as for all income quintiles in the period of 2002 – 2008. The decreasing trend in real expenditures was expected to be closely related to the sudden increasing in the price of rice in Indonesia in 2005 and the emerging of the global food crisis in 2008.

Generally, the real expenditure of food away from home tended to increase in the period of 1996 to 2014, and 2017 with the exceptionally decreasing from 2005 to 2008, for both income quintiles, as well as and for a rural and urban area. This implied that modernization in food consumption pattern has been in progress in Indonesia, but still susceptible to the world's food crisis happening in 2008.

The real expenditure for rice consumption for both urban and rural areas, as well as all of the income quintiles, tended to decrease for the period of 1999 – 2008. The declining trend seemed to be associated with the food crises in 2008. The trend of real expenditure for rice in the period of 2008 - 2014 for both urban and rural areas, as well as for all income quintiles, however, tended to regain its positions up to the expenditure levels in 1999.

The expenditure for processed rice, such as rice flour and rice noodle, has a different path compared to the expenditure on rice consumption. The expenditure for processed rice increased sharply in 2008, due to food crises. This implies that processed rice has not been a staple food for Indonesian, but rather it functioned as supplementary food to rice.

The per capita consumption of rice for home consumption has been decreasing over time since 1996, regardless of the income quintiles, as well as for the urban and rural areas. This implies that rice is a staple food for most Indonesian, but the consumers tended to diversify their staple food consumption to complement their calorie intake level.

The trends in the ratio of expenditure of rice for away from home consumption to the total food expenditure in an urban and rural area for both income quintiles have generally been increasing during the period of 1996 – 2014. This implies that there has been a changing pattern of consumers' lifestyles in consuming rice as a staple food. With a more urbanized economy, more women tend to work outside the household, and this will reduce their time availabilities to prepared foods in households.

It was found out that the estimation of the per capita of rice consumed away from home by using the direct conversion method (QRAFH) tended to decrease with the increase of income quintiles in a certain year. Meanwhile, the estimation of the per capita by using the other formula, on the contrary, were tended to increase with the increase of income quintiles. It seems that using the value of QRAFHS was a more reasonable estimation.

Policy Implication

Since the proportion of expenditure on food consumption away from home has increased, the government needs to pay attention to the quality of food consumption, especially for food safety. To increase balance, a nutritious food consumed by Indonesian people, option, processed food as consumed away from home should contain high nutritious values, safe, and sell at reasonable prices.

The increasing trend of real expenditure for food away from home and also processed rice both in the rural and urban areas indicated that modernization in food consumption patterns has been progressing for the Indonesian population. The higher the income group tended to be correlated with the higher the level of expenditure for food away from home. The implication from this finding is in order to obtained accurate data; the estimation of national demand for rice should consider the amount of rice eaten away from home consumption and also processed rice.

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