EU Agricultural Markets *Briefs*

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World food consumption patterns – trends and drivers

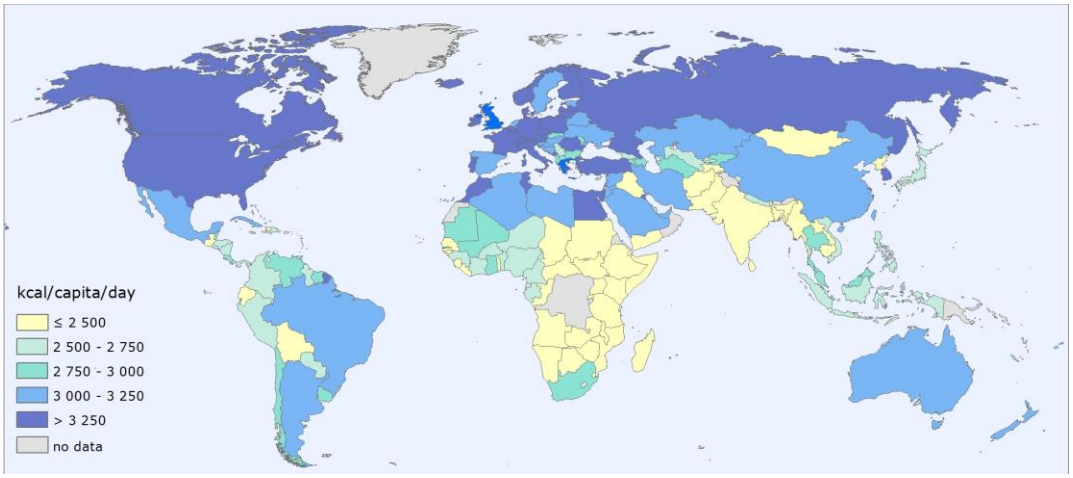
Contents

Since the mid-2000s agricultural and food prices moved to a higher level and in parallel with prices of other commodities – and at times have also been very volatile. These events led to concerns which, in different ways, brought to the forefront a debate about food security. Both developed and developing countries saw their consumers facing the impact of higher food prices, and their producers feeling the pressure from higher input costs.

In a series of *Briefs* (on Demand, Regional influences, Supply and Stocks) we analyse evolutions in different drivers responsible for these price developments separately and bring them together in a concluding *Brief*.

This second *Brief* focuses on identifying the main trends in demand and the main drivers explaining these trends.

Map 1 World food availability per capita (average 2009-2011)



Source: FAO, Food Balance (Faostat).

EU Agricultural Markets Briefs are available on Europa:
http://ec.europa.eu/agriculture/markets-and-prices/market-briefs/index_en.htm

Agriculture and Rural Development

1. Introduction

This *Brief* tries to put in context some of the perceptions surrounding the most obvious driver for the price spike in the previous decade, the worldwide increase in demand. More people on earth, with generally better living standards, consume more and better food, as well as other products and services derived from agriculture. To focus on how these patterns changed during the last 50 years and make the story more tangible, we distinguish between five periods[1] characterized by important macro-economic or geo-political events and between developed and developing countries[2].

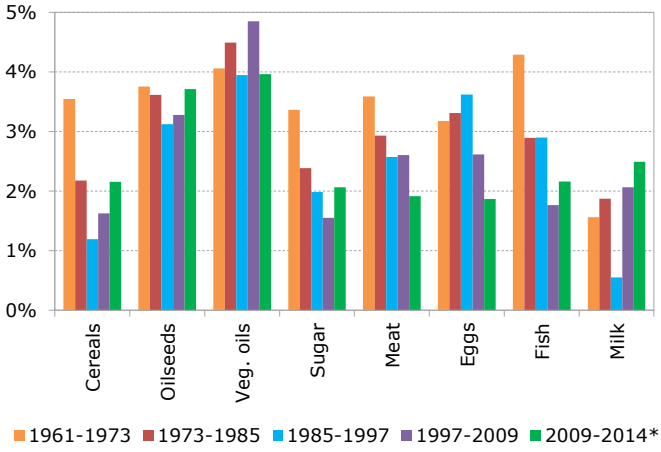
2. Is demand growth faster than in the past?

Over the last 50 years, consumption grew fast across all the major agricultural commodity groups (see Graph 1). The 'golden sixties' remain the period with the highest growth rates for the majority of products. Recently, growth is again accelerating for some commodities, such as oilseeds, cereals and milk, while it is slowing down for other, such as eggs and meat. The reduction in meat consumption growth in the most recent period is linked to tight supply availability, high prices, the effect of the economic crisis and possible changes in consumer preferences in developed countries, such as the US and the EU. Over the entire period, we see the highest growth rates for oilseeds, vegetable oils and meals, due to the increased consumption in developing countries and the increased industrial use of oilseeds, among others for the production of feed concentrates and for the production of biofuels in the last decade.

The development of demand growth is not homogenous across regions. Demand in the developed regions has reached a state of maturity, growing at a moderate pace, but demand growth in the developing parts of the world is much faster. The demand epicentre across the world is shifting, with demand from developing countries now exceeding the demand from developed countries, as Graph 2 illustrates for wheat and milk and Graph 3 for beef and poultry. The trajectory in developing countries has been different for animal products, with higher growth rates compared to cereals, but starting from a lower base. Beef growth lags behind, both in the developing and developed world.

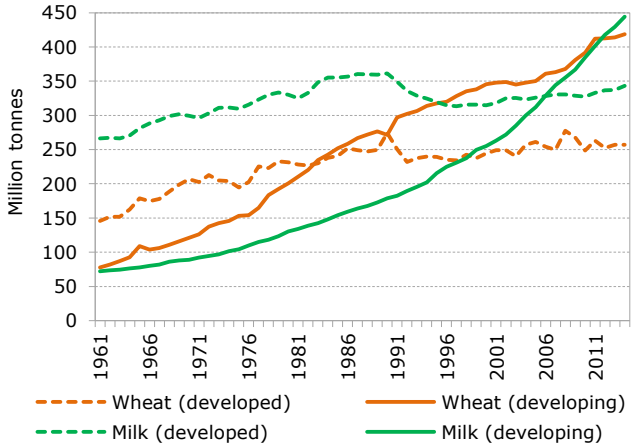
So the world is consuming more, and shifts between commodities occur.

Graph 1 Annual growth rate of world agriculture commodity consumption



*2009-2011 for Eggs.
Note: The low milk consumption in 1985-1997 is due to a drop-back in the USSR after its reform, as well as poor data quality.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

Graph 2 Evolution of consumption of wheat and milk in the developed and developing countries

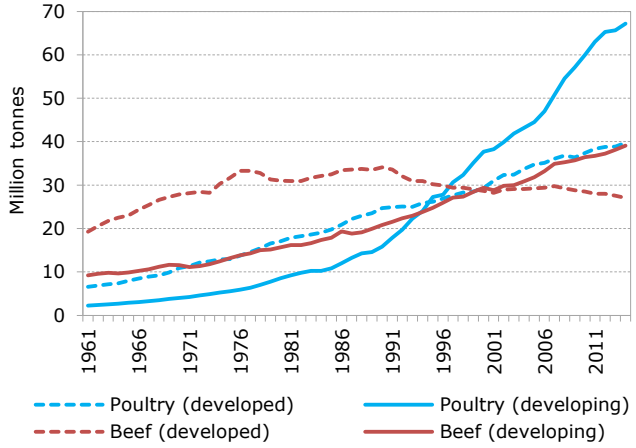


Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

[1] The period *1961-1973* is known as the 'Golden sixties' with prosperous economic growth. The period of *1973-1985* started with the first oil crisis and was marked by high oil prices and a general recession. The period of *1985-1997* was characterized by strong political and institutional reforms. In the period *1997-2009* world economy boomed under the liberalisation of markets and the growth of middle income countries, to end with the bubble of the financial and economic crisis of 2009. The last period, *from 2009 till today*, shows the recovery of the world economy after its major economic crisis. Choosing other periods affects the magnitude of these results but not the main trends.

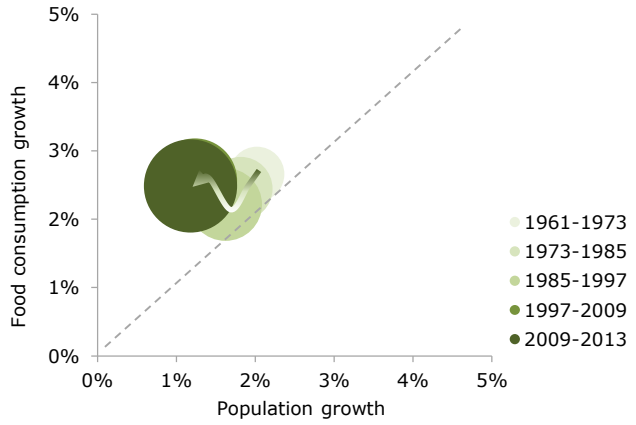
[2] Following common practice, we have considered Europe, United States, Canada, Australia, New Zealand and Japan as 'developed'. In some cases and for statistical reasons, all former USSR countries have been considered as 'developed'.

Graph 3 Evolution of consumption of poultry and beef in the developed and developing countries



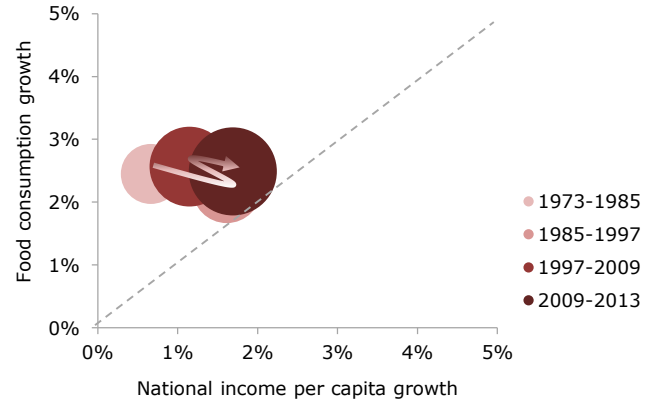
Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

Graph 4 World yearly food consumption growth versus population growth



Source: DG Agriculture and Rural Development based on data from FAO (Faostat Population and Production).

Graph 5 World yearly food consumption growth versus national income per capita growth



Source: DG Agriculture and Rural Development based on data from the World Bank (World Development Indicators) and FAO (Faostat).

3. What is triggering demand growth?

The main drivers for a growing food demand are the increase in world population and the increased consumption per capita. The latter is associated with an increase in per capita income.

Is consumption growing faster than population and income?

The following graphs compare annual growth rates of consumption (vertical axis) and population (horizontal axis). The closer the respective rates are, the closer the consumption bubble is to the iso-growth dotted line (the size of the bubble reflects the volume of consumption).

As illustrated in Graph 4, food consumption growth[3] declined up to the period 1997-2009. In this period of accelerating consumption, the growth rate recovered to the 1961-1973 level. This growth rate is maintained in the current period. The arrow in the Graph shows the direction of change. Food consumption growth in the different periods clearly outpaces population growth, which is steadily declining over time, implying higher per capita consumption.

National income per capita[4] (Graph 5) shows low to modest growth rates, recently picking-up after the decline due to the financial crisis in the 1997-2009 period. Both graphs combined seem to indicate that the growth in overall food consumption is indeed resulting from the combined effect of population and income per capita growth. In the following section we further explore this.

Population growth

One of the most popular drivers cited for demand growth increase is population growth. Although the population in absolute terms is still growing significantly (81.4 million extra in 2013, reaching 7.12 billion), population growth is slowing down (Graph 6), especially in the developed countries. Population is expected to reach the 9.6 billion figure around 2050 (UN, 2012). Most of the population increase will take place in developing countries.

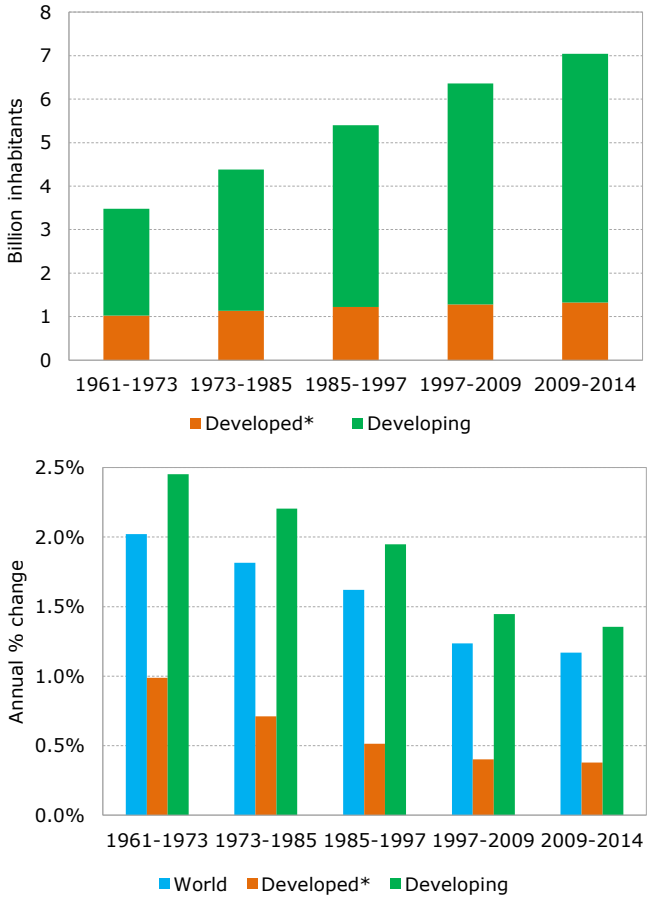
The main reason for the exponential population growth in the last 50 years has been the decreasing mortality of both infants and elderly, due to better

[3] The food production index is used as proxy for food consumption, as in the long term at world level production should meet consumption.

[4] Data in Faostat only available from 1970: first period excluded.

medical care and better nutrition. During the demographic transition, fertility rate also dropped, slowing down the population growth.

Graph 6 World population growth



*For statistical reasons, all former USSR countries have been considered as developed.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

Consumption versus population growth

World consumption growth outpaces population growth for the major commodity groups, with vegetable oils being the most extreme case (Graph 7). Dairy and meat products show opposite trends, with consumption growth of dairy increasing over the different periods and that of meat decreasing.

Vegetable oil consumption growth is mainly driven by increased use for food (80% of total use), although in more recent periods industrial use and particularly biofuel use have gained importance. Palm and soya oils are the main contributors to this high growth.

Cereal consumption is again increasing in recent periods, especially for maize. As opposed to wheat and rice, which have growth rates below or near population growth, maize consumption growth is high and accelerating (at about 4% in the most recent period). This can be linked to the high yield growth compared to wheat and rice as well as to its multipurpose use for food, feed and fuel production.

Sugar and sweeteners consumption growth steadily decreased to nearly reach the pace of population growth in the 1997-2009 period. In the last period growth accelerated again, as consumption in developing countries has remained firm while stabilizing in developed countries.

World meat consumption growth continues to decline to nearly reach the pace of population growth in the current period. While beef and veal consumption[5] was nearly stable (+0.2%/year) in the last period, pig meat consumption growth stabilised at around 2% and the growth in poultry meat was the highest at 2.7%. Pig meat remains the most popular meat with a share of 38% in total meat consumption worldwide, compared to 35% for poultry meat and 23% for beef and veal, but poultry meat is expected to surpass pig meat consumption by 2020[5]. Nevertheless, poultry consumption growth is also becoming less dynamic, with a growth rate in the last decade at half the rate of the 1985-1997 period.

Consumption dynamics differ considerably between developed and developing countries (Graph 8). The split confirms the reduction in meat consumption growth to a level slightly above population growth, both in developed and developing countries. The decrease in developing countries is however more significant, and mainly attributed to beef and poultry. Up to the period 1985-1997, beef and poultry meat consumption was growing fast, with poultry even topping to 9% per year. In the last two periods, growth rates started decreasing. The beef consumption growth rate has now dropped below the population growth rate, while poultry meat reduced to a level comparable with pig meat. Pig meat consumption showed the highest growth rate in the sixties (nearly 9%) and dropped afterwards, to stabilize in the last period around 3.5%. The current growth reduction can mainly be attributed to the effect of the economic crisis and tight supplies.

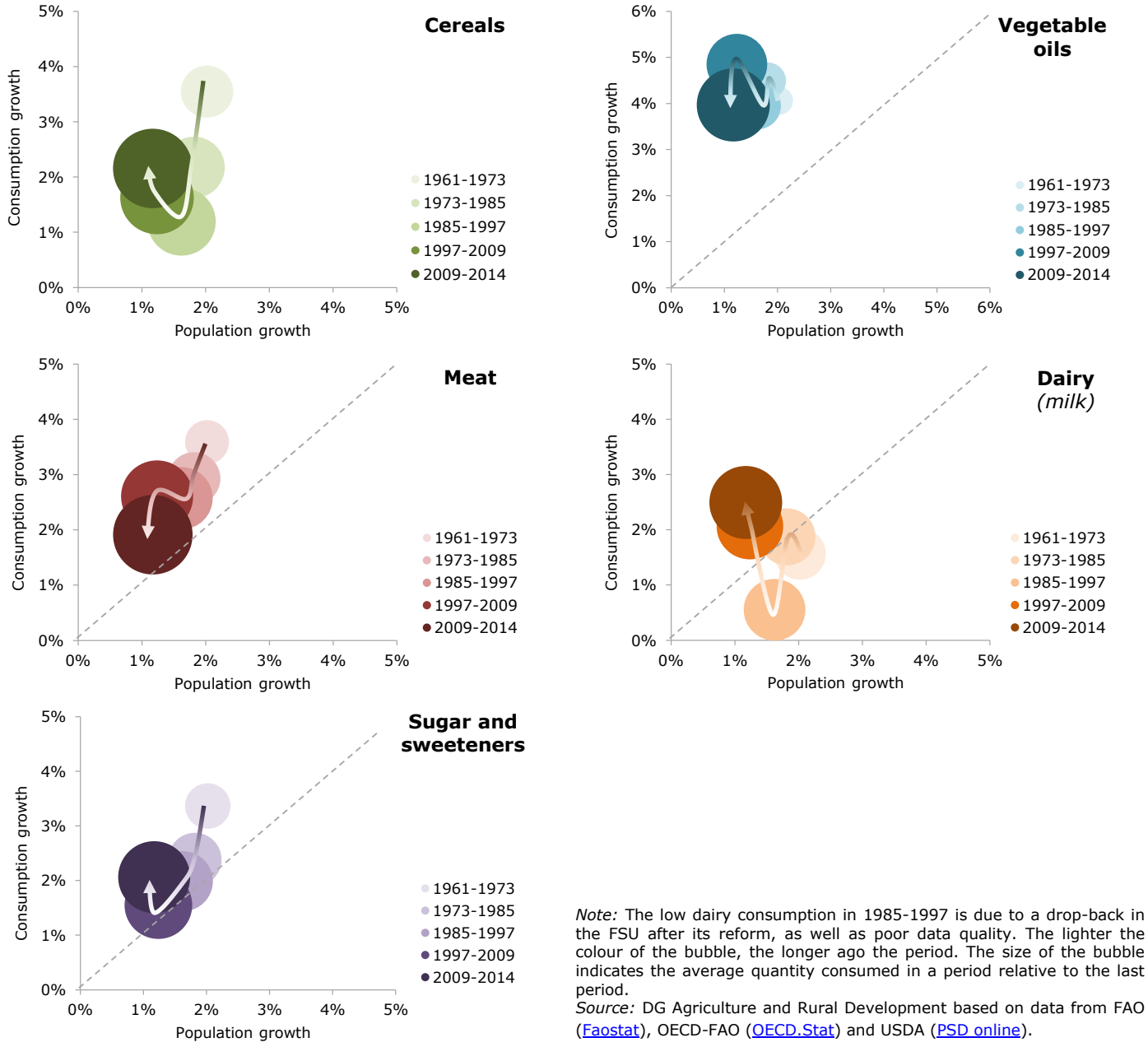
Vegetable oils are mainly consumed in the developing world, with high and increasing growth rates. While vegetable oils are mainly used for cooking in

[5] OECD-FAO Agricultural Outlook 2014-2023.

developing countries, they are also significantly used as feedstock for biofuel production in developed countries. In the 1997-2009 period vegetable oil consumption increased strongly (to 4% per year) due to the lift-off of the biodiesel market. This biodiesel surge seems over now, with the vegetable oil growth rate dropping back to 1% per year, slightly above the population growth rate.

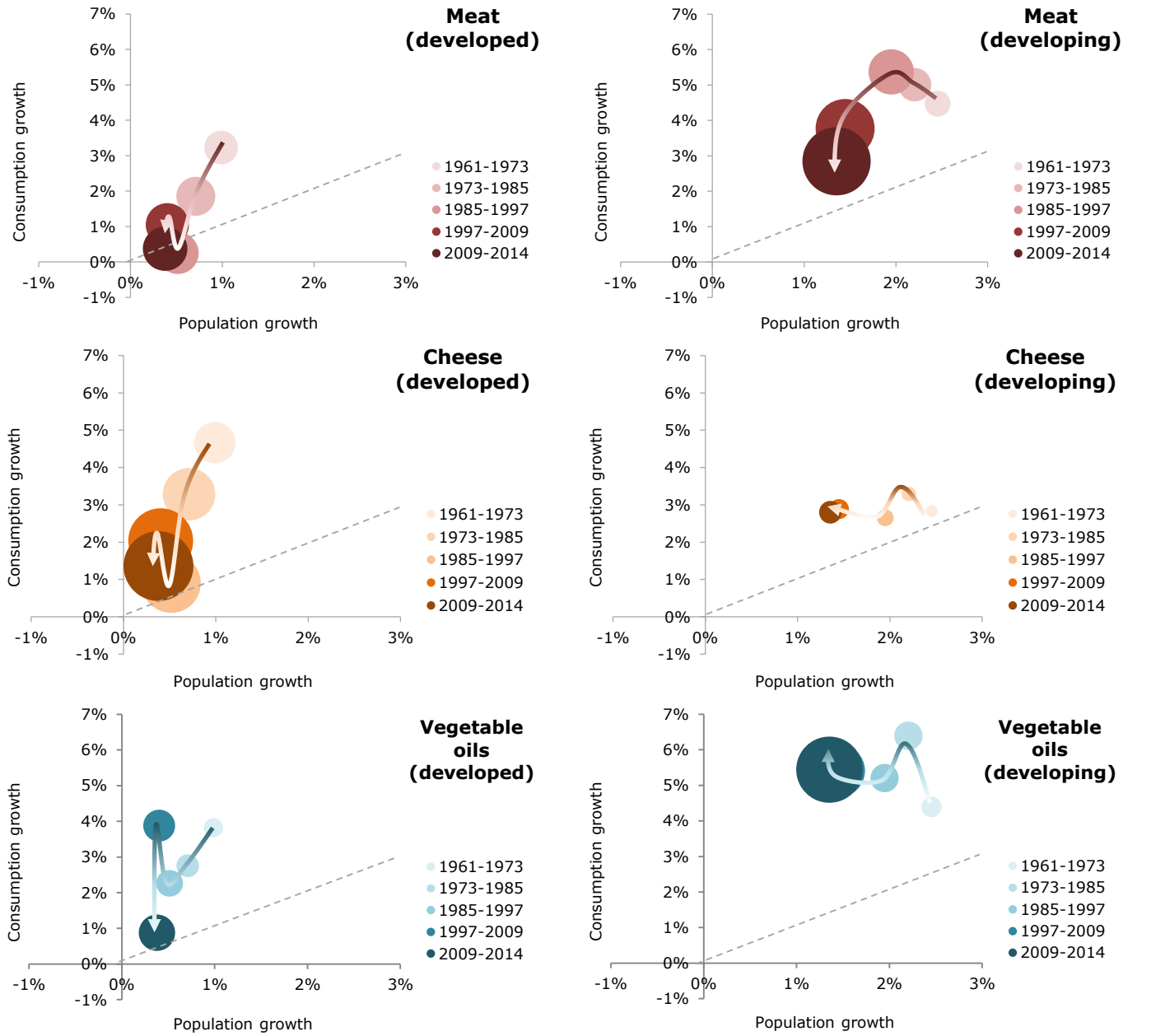
Zooming in on the different dairy products shows high and increasing growth rates for butter (to around 3%/year in the last period) and whole milk powder (6%). The growth rate of cheese, the most popular processed dairy product and mainly consumed in developed countries, is considerably above population growth, although it is steadily decreasing over time in developed countries as opposed to developing countries. Consumption of cheese, a high value added product, is growing faster in the developing countries, but consumption is still marginal compared to developed countries. Skimmed milk powder follows a bumpier ride, recently recovering from a low growth rate in the 1997-2009 period.

Graph 7 World yearly consumption growth versus population growth for cereals, vegetable oils, meat, dairy and sugar and sweeteners



Note: The low dairy consumption in 1985-1997 is due to a drop-back in the FSU after its reform, as well as poor data quality. The lighter the colour of the bubble, the longer ago the period. The size of the bubble indicates the average quantity consumed in a period relative to the last period.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat), OECD-FAO (OECD.Stat) and USDA (PSD online).

Graph 8 Consumption versus population growth in developed and developing countries for meat, cheese and vegetable oils



Note: The lighter the colour of the bubble, the longer ago the period. The bubble size corresponds to consumption size of developing versus developed within each commodity.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat) and OECD-FAO (OECD.Stat).

Changing income and consumption per capita

As the previous section shows, consumption not only follows but exceeds population growth, especially in the developing countries. This indicates that consumption per capita keeps growing. This is linked to the improvement in income per capita across the world, and especially in developing regions. Drivers for an improved income per capita are, among other, productivity gains, increased industrialisation, better education, government spending on infrastructure, and higher consumption stimulating the economy.

Net income per capita has steadily increased across the world (by 71% between 1970 and 2012, Table 1). This number hides considerable differences across regions. The BRICS[6] experienced a noticeable increase in income per capita since 2000. In China for

[6] BRICS stands for Brazil, Russia, India, China and South Africa.

example, real net per capita income rose by 180%[7] between 2000 and 2012. Main future consumption growth is expected to come from middle income households. Their share differs strongly among countries. In China and India for example, the income share held by the middle income households[8] amounts to 50% and remains stable since 1985. They thus also profit from the increase in national income. In other countries, such as Brazil, this share is considerably lower (around 32%), while in South-Africa income inequality is even increasing.

The share of expenditure on food in total expenditure drops back when income increases. Table 2 shows the development in shares in time and between selected countries. For all countries the share reduces over time, with the US in the lead. China and especially India are spending their increase in income mainly on non-food items.

[7] See EU Agricultural Markets *Brief* No 7, 'Regional perspectives on food supply and demand'.

[8] Excluding the 20% richest and poorest households.

Table 1 Evolution in economic indicators from 1961 onwards *(in 2005 constant prices)*

Indicator	Region	Average quantity					Compound annual growth rate (%)				
		1961-1973	1973-1985	1985-1997	1997-2009	2009-2012	1961-1973	1973-1985	1985-1997	1997-2009	2009-2012
GDP (trillion USD)	World	13.5	21.6	30.9	43.8	53.2	5.4	2.9	3.0	2.7	2.9
	Developed*	11.8	18.1	25.0	33.4	37.4	5.2	2.6	2.5	1.9	1.7
	Developing	1.7	3.5	5.9	10.4	15.9	6.5	4.7	5.0	5.0	5.7
National income per capita (1000 USD)	World	-	4.1	4.9	5.8	6.3	-	0.6	1.6	1.2	2.0
	Developed*	-	13.5	17.5	22.3	23.8	-	1.4	2.2	1.4	1.4
	Developing	-	0.9	1.2	1.7	2.2	-	1.5	3.1	3.0	5.2

*For statistical reasons, all former USSR countries have been considered as developed.
Source: DG Agriculture and Rural Development based on data from the World Bank (World Development Indicators).

Table 2 Share of food expenditure in total expenditure for selected countries

Country	Before 1990	2006			2013
		National	Rural	Urban	
United States	18	14	14	14	9
United Kingdom	23	23	-	-	13
China	52	40	43	36	30
India	64	47**	52	39	32
Russia	55*	36	-	-	39
Ghana	61	51	56	48	-

*1995; **Approximation based on 2004 and shares rural/urban in 2006.
Source: FAO Statistics Household Survey Database (Faostat); USDA for 2013 (Food expenditures).

Table 3 Evolution in food and protein consumption per capita

Total supply of*	Region	Average quantity					Compound annual growth rate (%)				
		1961-1973	1973-1985	1985-1997	1997-2009	2009-2011	1961-1973	1973-1985	1985-1997	1997-2009	2009-2011
Food (kcal/capita/day)	World	2 315	2 476	2 626	2 750	2 847	0.7	0.7	0.3	0.4	0.8
	Developed	3 079	3 220	3 285	3 351	3 366	0.6	0.3	-0.1	0.3	0.1
	Developing	2 022	2 234	2 466	2 647	2 767	1.0	1.0	0.7	0.5	1.0
Protein (g/capita/day)	World	64	67	71	76	80	0.4	0.6	0.5	0.6	0.9
	Developed	94	99	102	102	103	0.6	0.5	-0.2	0.2	-0.2
	Developing	52	56	64	71	76	0.7	0.9	1.1	0.7	1.3

*Proxy for daily calorie and protein intake per capita; no data on waste per capita available.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

Table 4 Evolution in world food supply per capita

Share in total caloric intake	Average quantity					Compound annual growth rate (%)				
	1961-1973	1973-1985	1985-1997	1997-2009	2009-2011	1961-1973	1973-1985	1985-1997	1997-2009	2009-2011
Cereals (%)	49.8	50.2	50.2	47.3	45.4	0.1	0.1	-0.2	-0.6	-0.4
Vegetable oils (%)	5.7	7.0	8.4	9.2	9.7	1.5	2.0	1.0	0.9	-0.1
Meat (%)	5.5	6.0	6.8	7.6	8.0	1.1	0.8	1.0	1.0	-0.1
Dairy (%)	5.1	4.7	4.5	4.6	4.8	-1.1	-0.1	-0.5	0.6	0.7
Fish (%)	0.8	0.9	1.0	1.1	1.2	1.4	0.4	0.6	1.0	0.7
Eggs (%)	0.8	0.9	1.0	1.2	1.2	0.2	0.9	1.6	0.9	-0.8
Sugar and sweeteners (%)	9.0	9.3	8.8	8.4	8.0	0.5	-0.1	-0.4	-0.7	-0.8

Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

The diet is also changing

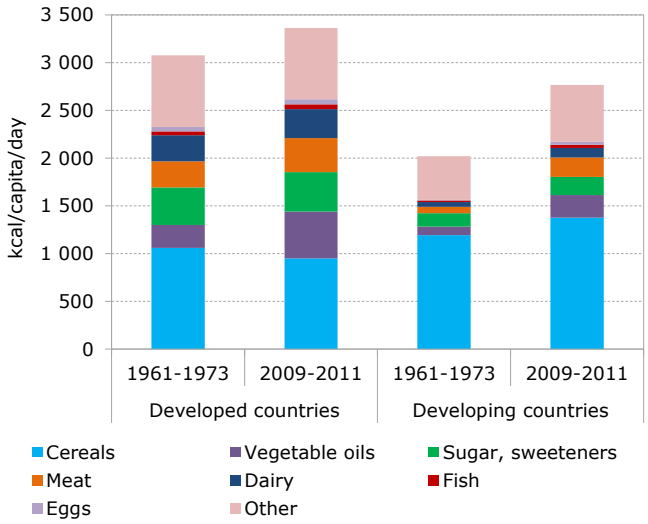
Consumption per capita has increased substantially over the last decades (both in energy and protein content, Table 3). The annual growth rate remains moderate on aggregate world level (except for the recent post-crisis period). This is especially the case for the developed countries, where both calorie and protein intake remain relatively stable. Growth rates are consistently higher in developing countries, but consumption levels per capita are still much lower. Up to today, developing countries have not yet reached the intake levels of the developed countries.

The evolution in diet is mainly influenced by higher income per capita but food prices, individual and socio-cultural preferences, the development of the cold chain as well as other concerns play a role. When focusing on dietary shifts, cereals and sugar have become proportionally less important, as opposed to meat and vegetable oils (Table 4). The shares of meat, fish and eggs in total protein availability per capita have steadily increased over time. The growth of this share has however stabilised for fish and is negative for meat and eggs in the last period. Dairy products have a stable share of around 10% in total protein intake.

In developed countries, main dietary changes compared to the period 1961-1973 are the reduction of cereals, while mainly vegetable oil and, to a smaller extent, meat intake increased (Graph 9)[9]. In the last periods, animal protein intake is stabilizing. There seems to be an increasing part of the population interested in reducing/replacing their daily animal protein intake, for various reasons (ethical, health-related, environmental and economic).

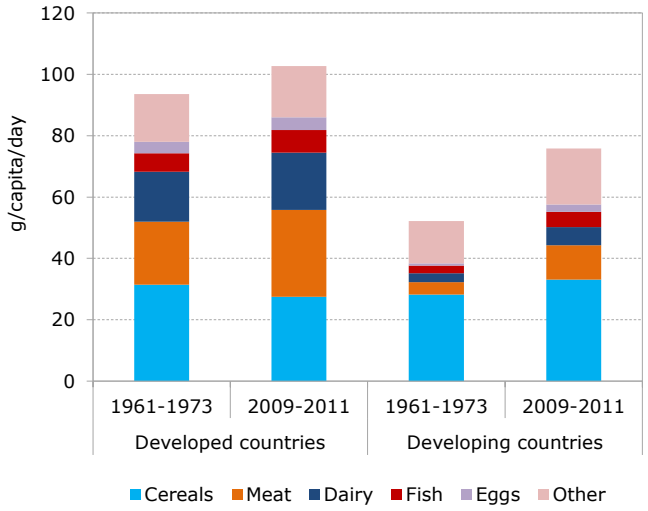
The picture for developed countries contrasts with the one for developing countries, where the diet has diversified compared to the past. Cereals, including rice, as well as vegetable oil, sugar, meat and dairy intake are higher compared to 1961-1973, although in more recent periods cereal intake is stagnating and even declining. The share of cereals also exceeds the share of developed countries. Vegetable oils and all the animal proteins (meat, dairy, fish and eggs) show high and positive growth numbers in the last periods.

Graph 9 ***Changes in per capita calorie availability in developed and developing countries***



Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

Graph 10 ***Changes in per capita protein availability in developed and developing countries***



Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

As indicated by WHO/FAO experts, there is a strong positive relationship between the level of income and the consumption of animal protein, with the consumption of meat, milk and eggs increasing at the expense of staple foods[10]. While in developing countries per capita meat consumption growth peaked above 4% in the period 1985-1997, it decreased

[9] The per capita food supply is used as a proxy to observe changes in diets. Therefore the higher vegetable oil intake should not be entirely interpreted as a higher use of vegetable oils for cooking given 45% (2009-2011 avg.) of these oils are used for biofuel production in developed countries.

[10] Joint WHO/FAO Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases (2002: Geneva, Switzerland). *Diet, nutrition and the prevention of chronic diseases: report of a joint WHO/FAO expert consultation*, Geneva, 28 January - 1 February 2002.

afterwards to currently reach the same level as the general per capita consumption growth. Increases in total protein availability per capita are now mainly driven by dairy, fish and pulses. Sugar intake is also stabilising. These numbers seem to suggest that the diet in developing countries is slowly evolving in the direction of the developed countries, with the exception of sugar.

Urbanisation and aging

The world is also becoming increasingly urbanised, and urban population today exceeds rural population (Table 5). Urban areas typically have a lower relative expenditure on food than rural areas, due to income differences, access to cheap food and different dietary preferences. Rural dwellers tend to eat traditional diets that are high in grains, fruit and vegetables, and low in fat, while groups moving from rural to urban areas experience an increased intake of energy, sugar, refined grains and fats. They also switch to processed food[11]. Moreover, their diet is richer in animal proteins, with higher consumption of meat, poultry, milk and other dairy products[11]. Urbanisation is therefore considered as a major driving force influencing global demand for animal products, as it stimulates improvements in infrastructure, including cold chains, which allow an increasing trade in perishable goods.

As a consequence of better income and health care services across the world, world population is also aging, creating again shifts in dietary habits. As elderly people are more susceptible to diseases, the importance of a balanced energy- and nutrient-rich diet increases.

[11] Hoffman D.J. (2001), Obesity in developing countries: causes and implications, FAO Food and Nutrition Division.

Table 5 Shift from rural to urban population and age shift

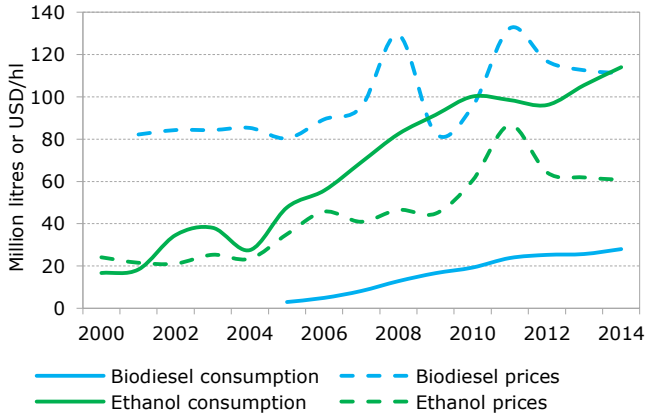
Indicator	Region	Average quantity					Compound annual growth rate (%)				
		1961-1973	1973-1985	1985-1997	1997-2009	2009-2014*	1961-1973	1973-1985	1985-1997	1997-2009	2009-2014*
Share of urban population (%)	World	35.9	39.1	43.4	48.3	52.4	0.8	0.8	0.8	1.0	0.9
	Developed**	64.0	68.7	71.1	73.5	75.8	0.8	0.4	0.2	0.4	0.3
	Developing	24.2	28.8	35.3	41.9	47.0	1.4	1.8	1.5	1.4	1.3
Share of population ≥ 65 (%)	World	5.2	5.9	6.3	7.1	7.7	0.7	0.7	0.9	1.1	1.2
	Developed**	9.3	11.0	12.4	14.4	15.7	1.5	0.9	1.4	1.1	1.4
	Developing	3.6	4.1	4.5	5.3	5.9	0.6	1.1	1.0	1.4	1.4

*2009-2013 for Share of population ≥ 65.
**For statistical reasons, all former USSR countries have been considered as developed.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat) and the World Bank (World Development Indicators).

Is industrial use to blame?

Of the many industrial uses[12] of agricultural raw material, biofuels are the most important. The recent increase in demand for agricultural commodities, and especially for cereals and oilseeds, is often associated with the (policy driven) market expansion of biofuels. Main market players are the US, Brazil and the EU and main commodities concerned are maize, sugar cane and rapeseeds. While the US and Brazil focus more on ethanol, biodiesel, produced from vegetable oils, is more popular in the EU. The current (volume) share of ethanol in total gasoline amounts to 8.6% in the US, 55.2% in Brazil and 4.7% in the EU, while for biodiesel in diesel it is 1.9%, 6.2% and 5.7% respectively[13]. While ethanol is used already since some decades, biodiesel only became of interest as of 2005 onwards. Graph 11 shows the increase in consumption from 2005 onwards, which is high for both ethanol and biodiesel, the latter starting from a very low base.

Graph 11 World evolution of biodiesel and ethanol consumption and price since 2000



Source: OECD-FAO Agricultural Outlook 2014-2023 (OECD.Stat).

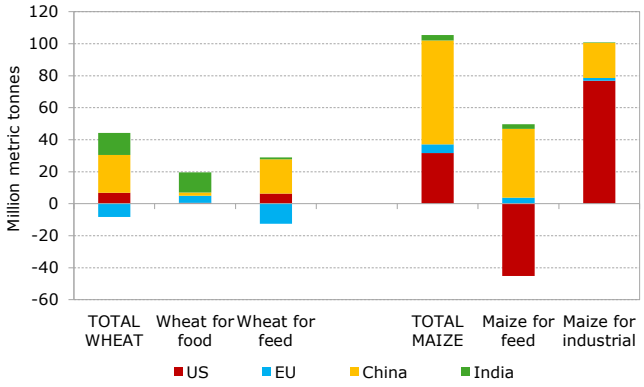
[12] Other examples are bioplastics, textiles, cosmetics, building material or pharmaceutics.

[13] OECD-FAO Agricultural Outlook 2013-2022.

Many studies have been devoted to the question whether the use of cereals and oilseeds for biofuel production has pushed commodity prices upward. They point in the direction of moderate to significant cereal and oilseed price increases in the countries with biofuel targets, while the effect on world prices are more questionable, given the small share of area devoted to biofuel production in total grains and oilseeds area.

Exploration of the changes in cereal demand growth between 2005 and 2012 reveals that key cereal consuming countries are reallocating grains to different uses (Graph 12). While wheat demand growth in India is fully captured by human consumption, China's growth is mainly realized in animal consumption. Europe's wheat consumption is contracting, mainly at the expense of feed wheat. The main expansion in maize consumption originates from China for both feed and industrial use. The US is substituting maize for feed by maize for industrial use (mainly ethanol and isoglucose).

Graph 12 Changes in grain demand, 2005 to 2012



Source: DG Agriculture and Rural Development, Medium-term prospects for EU agricultural markets and income 2014-2024, based on data from the OECD-FAO Agricultural Outlook 2014-2023.

4. Some demand projections towards 2050

In the coming 10 years, the OECD-FAO Agricultural Outlook (2014) expects demand to remain firm but expanding at lower rates compared to the past. They also presume a dietary shift more into the direction of higher protein, fats and sugar content. These demand projections entail that main growth is realized in livestock and biofuel production, and a relative shift occurs from staple food crops like wheat and rice towards coarse grains and oilseeds.

More forward looking towards 2050[14], world population is expected to reach 9.3 billion, with a growth rate further slowing down. About 70% of the world's population will be urban, compared to 53% today. GDP and per capita income are assumed to increase strongly (2.5 and 1.8-fold resp.). Global demand for agricultural products on its turn is expected to grow at 1.1% per year, down from 2.2% per year in the past four decades. This means global production in 2050 should be 60% higher compared to 2007. Although land and water resources are more stressed and growth of crop yields has slowed down, the forecast predicts sufficient water and land availability to meet this increase in consumption, albeit at the expense of important investments.

The share of people consuming more than 3 000 kcal/person/day may reach 52% in 2050 compared to the present 28%. More strikingly, the share of those consuming less than 2 500 kcal/person/day is expected to drop from 35% to 3%.

Main relative increases in per capita consumption are expected for milk, meat and vegetable oils, while cereals remain stable, both in developed and developing countries. Due to among other religious reasons, the transition towards livestock based diets is not expected to take place in all developing countries.

Effects of demand changes on prices are subject to uncertainty in the long run. Overall demand growth is expected to slow further globally. However, particularly in developing countries, demand for some income-sensitive products, such as meat and dairy products, is expected to accelerate, further tightening demand-supply balances. Also in developing countries, insufficient investments in productive capacity and R&D to increase productivity growth could keep supply response low and markets tight. Evolutions in the biofuel demand may further influence prices upward, although recent trends seem to suggest otherwise.

[14] Alexandratos, N. and J. Bruinsma. 2012. World agriculture towards 2030/2050: the 2012 revision. ESA Working paper No. 12-03. Rome, FAO.

5. Conclusions

The increase in food price level and volatility of the last decade triggered renewed interest in the underlying fundamental drivers, of which demand is the most prominent. Demand growth is consistently positive across different food commodities and periods, and there seems to be a trend break in aggregate demand growth with the turn of the century (Graph 13). While decelerating up to 1985-1997[15], demand growth recovered in the following periods. The downward trend can be attributed to decreasing population and per capita consumption growth. The growth recovery can be mainly related to high and accelerating growth in developing regions, both in per capita consumption and non-food consumption. In a following *Brief* on emerging economies we elaborate this further. In the developed regions consumption growth is further reducing. When focusing on the different products, the decreasing growth of meat consumption, both in developed and developing regions, which is no longer outpacing population growth, is compensated by increasing growth in maize, milk and sugar consumption.

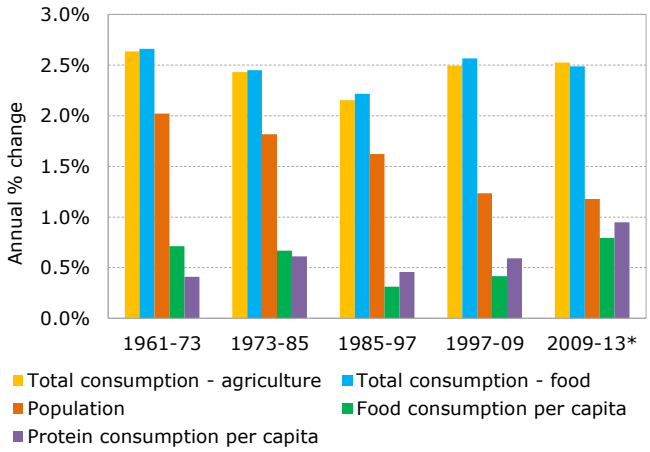
Population growth is slowing down in developing countries and stagnating in developed. However consumption per capita is increasing further (Graph 13) for a majority of commodities. This is especially true in developing countries, where calorie and protein intake is still far below the intake in the developed countries and is increasing at a fairly constant rate. The dietary pattern is also changing, in favour of vegetable oils and animal proteins at the expense of cereals. General income growth as well as increased urbanisation are associated with these shifts.

Biofuel consumption has significantly increased in the last decade. Its impact on cereal and oilseed demand remains mainly limited to the regions with high biofuel consumption. Due to environmental and market constraints, this consumption recently seems to stagnate in the EU and US.

The analysis of demand showed that the epicentre of increased growth resides in the developing countries.

In the coming future it is expected that the growth in general demand will start to slow-down, due to decreasing population growth and stabilising consumption per capita. In the meantime, the dietary pattern in the developing countries will further shift towards the more costly vegetable oils and animal proteins at the expense of cereals.

Graph 13 Annual growth in world consumption, population and food and protein consumption per capita across the different periods



*2009-2011 for food and protein consumption per capita.
Note: FAO Agricultural production index has been taken as a proxy to calculate total consumption growth. The effect of stock rebuilding is not accounted for. Consumption per capita refers to food availability in kCal per capita.
Source: DG Agriculture and Rural Development based on data from FAO (Faostat).

[15] The low consumption growth in 1985-1997 can also be partly attributed to a drop-back in the USSR after its reform, as well as poor data quality in that period.

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