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Temporal and spatial consumption of meat in the Central Asia region

ABDUL WAHID[1] and S. K. SRIVASTAVA[2*]

[1]Department of Agricultural Economics and Extension, Sayed Jamaluddin Afghani University, Kunar province, Afghanistan and [2] Department of Agricultural Economics, College of Agriculture, G.B. Pant University of Agriculture and Technology, Pantnagar-263145 (U.S. Nagar, Uttarakhand)
[*]Corresponding author's email id: sks_pantnagar@yahoo.com

ABSTRACT: In agricultural economy, livestock sector plays primary and budding role to provide livelihood for the large part of poor people in the world and fairly contributes to the gross domestic product (GDP) of the country. The study examined the status of production and consumption of meat in different countries of Central Asia region from 2000 to 2017. Descriptive statistics like average, percentage, etc. were used. In all the countries, of Central Asia region meat production has increased from 15 per cent in Kyrgyzstan to 274 per cent in Tajikistan during this period on account of increase in the number of major animals and poultry birds. In Central Asian countries, except Kyrgyzstan, meat consumption increased by higher percentage than that of in the region as a whole (93.44 per cent) and in Asia (58.59 per cent) in all the countries, in the year 2017 over the year 2000. Per capita consumption of meat was highest (185.75 gram/day) in Kazakhstan while the lowest level (45.45 gram/day) was observed in Tajikistan during 2017. The highest increase of 86.88 percent was found in Tajikistan while, the lowest increase in per capita consumption was found in Kyrgyzstan is less than 1 percent.

Key words: Central Asia, increase in human population, increase in livestock, meat production, meat consumption, per capita availability

In the agricultural economy, the livestock sector plays a primary and emerging role, providing livelihood for a large proportion of the world's poor and contributing fairly to the gross domestic product (GDP) of the country. FAO data of 2016 shows that the livestock sector contributed 2.5 percent to the GDP of Asia as a whole and 30 percent to the GDP of agriculture. The livestock sector grew at an annual rate of 5.6 percent (Sugiyama *et al.*, 2003). In Kazakhstan, the agricultural sector contributed 4 percent of the total GDP, of which the livestock sector accounted for 38 percent, while agriculture accounted for 15 percent of the total and the livestock sector accounted for more than 54 percent in 2016 (Robinson, 2020). Foods of animal origin (meat, milk and eggs) are useful components of most diets, containing high-quality biological protein and micronutrients such as iron and vitamin A that contribute to a healthy diet. Between the years 1960 and 2005, annual per capita meat consumption increased more than tripled in developing countries. These consumption changes, coupled with significant population growth and urbanization, have significantly raised demand for animal products in many developing countries. Many children suffer from malnutrition because Asian countries make up a larger proportion of the world's population compared to other countries. The food and nutritional security status of children in Asia seems poor as 70 per cent of the world's malnourished children live in Asia. Over 12 per cent of adults and children consume very few calories and 13 per cent of men and 17 per cent of women are underweight in Asia (Worldhunger.org). In Tajikistan, 27per cent of children under 5 years of age suffer from stunting, while Uzbekistan reached 20 per cent in 2012 (Robinson, 2020). Meat consumption can lead to increased greenhouse gas emissions and the depletion of water and land resources. It is also opined that excess use of meat increases the risk of cardiovascular disease and therefore, promotion of alternatives to meat protein consumption is important for food security. The World Health Organization has classified processed meats including ham, bacon, salami and frankfurter as a Group 1 carcinogen (known to cause cancer) which means that there's strong evidence that processed meats cause cancer. Eating processed meat increases your risk of bowel and stomach cancer. Red meat, such as beef, lamb and pork, has been classified as a

Group 2A carcinogen which means it probably causes cancer (Cancer council Australia, 2021). Dietary guidelines recommend a maximum of 455g cooked (600–700g raw weight) lean red meat per week, in order to meet iron and zinc recommendations. That's about one small portion (65g cooked/100g raw) if you're eating it every night of the week, or one larger portion (130g cooked/ 200g raw) every second day. Meat consumption is highest among men aged 19–50 years and all teenagers between 14–18 years, but women and girls are already at the lower end of the recommended meat consumption range, which is not ideal, given their increased iron requirements (Delfino, 2021). Central Asia is the region where a long-standing tradition of high meat consumption prevails. The average meat consumption in this region ranges from 50 kg to 70 kg per capita per year. The average daily intake (124.76 gram/day) is reported to be one of the highest (Ishige, 2008). Intra-regional variation is found across regions of the Asia continent. In the East Asia region China has a lion's share to the extent of 90.87 per cent in the meat production during 2017 while, rest of the 7 countries in the region together contributed less than 10 per cent (Wahid and Srivastava, 2021). In view of these reasons, this study was conducted to examine the status of per-capita meat consumption over time in all the countries of the Central Asian region.

MATERIALS AND METHODS

Methodology

The study is based on secondary data. The data was collected from FAO site for the period from 2000 to 2017. To examine the status of meat production and consumption descriptive statistics are used, like average, percentage, etc, for the two periods i.e. the year 2000 and year 2017, and status of meat is compared across the countries, in the region. The status of production, consumption and per capita consumption meat has been examined across the countries of Central Asia region. The changes in human population and major livestock animals are also worked out to analyze the results. Production data was available in the secondary sources but consumption data was not available. Therefore, availability of given product in the country is considered as total consumption of the product in that country. Total availability has also taken into account the net import quantity (total import – total export) in the given year (Wahid and Srivastava, 2022 and 2023). Total consumption of the product worked out as,

$C_{it} = P_{it} + I_{it} – E_{it}$

$PC_{it} = C_{it} / HP_{it}$

$PCD_{it} = ((C_{it} / HP_{it})*1000)/365$

Where,

C_{it} = Consumption of meat in i^{th} country (tones) in t^{th} year

P_{it} = Production of meat in i^{th} country (tones) in t^{th} year

I_{it} = Import of meat in i^{th} country (tones) in t^{th} year

E_{it} = Export of meat in i^{th} country (tones) in t^{th} year

PC_{it} = Per capita consumption of meat in i^{th} country (Kg/year) in t^{th} year;

HP_{it} = Human population in i^{th} country (number) in t^{th} year, and

PCD_{it} = Per capita per day consumption of meat in i^{th} country (gram/day) in t^{th} year

Therefore, to generate consumption data for different years, data on quantity of export and import of the selected livestock products, along with production data were collected across the countries of the Central Asia region.

RESULTS AND DISCUSSION

Country wise human population in Central Asia region

Country wise human population in Central Asia region for two years i.e. 2000 and 2017 is presented in the table 1.

The table reveals that human population increased in all the countries of Central Asia region in the year 2017 compared to that of the year 2000. Uzbekistan was the most populous countries in Central Asia region followed by Kazakhstan in both the years. In

Table 1: Country wise human population in Central Asia region

No.	Countries	Human Population		
		2000	2017	
		Million person	Million person	Change over the year 2000 (%)
1	Kazakhstan	14.92	18.08	21.16
2	Kyrgyzstan	4.92	6.19	25.79
3	Tajikistan	6.22	8.88	42.85
4	Turkmenistan	4.52	5.76	27.49
5	Uzbekistan	24.77	31.96	29.03

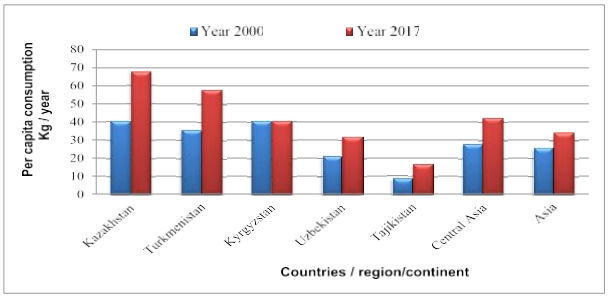


Fig 1: Per capita meat consumption in the countries of Central Asia region (Kg / year)

Table 2: Country wise population of major livestock animals and poultry birds in the Central Asia region (Million number)

No.	Countries	2000		2017			
		Major animals	Poultry birds	Major animals	Poultry birds	Change over the year 2000 (%) of Major animals	Change over the year 2000 (%) Poultry birds
1	Kazakhstan	14.64	18.022	25.91	39.95	76.94	121.68
2	Kyrgyzstan	4.84	2.98	7.70	4.74	59.08	59.16
3	Tajikistan	3.22	0.77	7.91	5.21	145.11	577.53
4	Turkmenistan	9.43	5.75	18.64	17.27	97.57	200.35
5	Uzbekistan	14.22	14.521	33.18	63.63	133.25	338.25

the year 2017, in Tajikistan population increased highest by 43 per cent, while lowest increase in population observed in Kazakhstan of 21.16 per cent during this period. The availability of per capita meat consumption depends on production and population trend, if total meat consumption increased more than population per capita meat consumption increases, on the other hand if population increased more than of total meat consumption per capita consumption decreases.

Country wise population of major livestock animals and poultry birds in Central Asia region

In the Asia continent poultry birds and major animals (pigs, cattle, buffalo, goats and sheep) are the main meat producing livestock which together contributed more than 93 per cent of the total meat produced during 2017. Therefore, change in population of these two groups across the different countries is also worked out to observe the major role of either change in livestock number or productivity thereof, in the increase of meat production from the year 2000 to the year 2017. If meat production increases in higher proportion than the proportionate increase in number of poultry birds and major animals, the situation indicates major role of technological advancement in the livestock sector for meat production in the respective country. Country wise population of major livestock animals and poultry birds in Central Asia region for two years i.e. 2000 and 2017 is presented in the Table 2.

The table reveals that in all the countries of Central Asia region both the population of poultry birds and major animals (cattle, buffalos, pigs, goats and sheep) increase in the year 2017 over the year the 2000. Highest increase is observed in both poultry birds and major animals in Tajikistan, while minimum increase is found in Kyrgyzstan in the year 2017 over the year 2000.

Status of meat production in different countries of the Central Asia region

Production of meat in different countries of Central region of Asia as well as Central region and Asia as a whole is presented in the Table 3.

The table depicts that in meat production, Uzbekistan, Turkmenistan and Tajikistan registered increase in their shares in both region and in the Asia, while Kazakhstan and Kyrgyzstan showed decrease in their shares in total meat produced in

the Central Asian countries in the year 2017 over the year 2000. The meat production increased highest in Tajikistan by more than 273 per cent, followed by Turkmenistan and Uzbekistan where it increased by more than 100 per cent, while in Kyrgyzstan meat production increased by less than 15 per cent in the year 2017 over year 2000. In all the countries in the region meat production has increased by 15 per cent to 274 per cent during this period on account of increase in the number of major animals and poultry. Number of poultry birds increased with quite higher per cent than that of animals in all the countries in the region except Kyrgyzstan wherein both increased by around 60 per cent. On over all bases this region performed better than that of per cent increased in meat production in Asia. This indicates that poultry sector is growing faster than that of other livestock in almost all the countries except Kyrgyzstan. Much variation observed in the effort made by different countries of Central Asia region to increase their meat production as 84 per cent variation is recorded in this regard therein.

Status of meat consumption in different countries of Central Asia region

Consumption of meat in different countries of Central region of Asia as well as Central region and Asia as a whole is presented in the Table 4. The table

Table 3: Status of meat production in different countries of Central Asia region

No.	Countries/ Region/ Continent	Year						
		2000			2017			
		Production (tonnes)	Share in Region (%)	Share in Asia (%)	Production (tonnes)	Share in Region (%)	Share in Asia (%)	Change over the year 2000 (%)
1	Uzbekistan	504400	34.69	0.55	1009903	37.98	0.71	100.22
2	Kazakhstan	574726	39.53	0.63	1008655	37.94	0.71	75.50
3	Turkmenistan	150000	10.32	0.16	308219	11.59	0.22	105.48
4	Kyrgyzstan	196192	13.49	0.21	225276	8.47	0.16	14.82
5	Tajikistan	28600	1.97	0.03	106721	4.01	0.08	273.15
6	Central Asia	1453917	100.00	1.59	2658774	100.00	1.87	82.87
7	Asia	91355271	-	100	141903358	-	100	55.33

Table 4: Status of meat consumption in different countries of Central Asia region

Sl. No.	Countries/ Region/ Continent	Year						
		2000			2017			
		Production (tonnes)	Share in Region (%)	Share in Asia (%)	Production (tonnes)	Share in Region (%)	Share in Asia (%)	Change over the year 2000 (%)
1	Kazakhstan	605830	39.31	0.63	1225867	41.12	0.80	102.35
2	Uzbekistan	522360	33.89	0.54	1023223	34.32	0.67	95.88
3	Turkmenistan	159171	10.33	0.17	332912	11.17	0.22	109.15
4	Kyrgyzstan	198622	12.89	0.21	251840	8.45	0.16	26.79
5	Tajikistan	55200	3.58	0.06	147363	4.94	0.10	166.96
6	Central Asia	1541181	100.00	1.60	2981205	100.00	1.95	93.44
7	Asia	96436811	-	100	153231535	-	100	58.89

Table 5: Status of per capita meat consumption in different countries of Central Asia region (Per person)

Sl. No.	Countries / Region/ Continent	Year				
		2000		2017		
		Kg / year	Gram / day	Kg / year	Gram / day	Change over the year 2000 (%)
1	Kazakhstan	40.60	111.23	67.80	185.75	67.01
2	Turkmenistan	35.24	96.55	57.82	158.41	64.05
3	Kyrgyzstan	40.36	110.58	40.69	111.48	0.80
4	Uzbekistan	21.09	57.78	32.02	87.72	51.82
5	Tajikistan	8.88	24.33	16.59	45.45	86.88
6	Central Asia	27.85	76.30	42.07	115.26	51.07
7	Asia	25.78	70.63	33.91	92.90	31.55

depicts that the Percentage share of different countries in meat consumption reveal that Kazakhstan consumed about 39.31 per cent of meat in the region and less than 1 per cent in Asia in the year 2000, which increased to 41.12 per cent in the region in the year 2017. Following the pattern, Uzbekistan, Turkmenistan and Tajikistan consumed 33.89, 10.33 and 3.58 per cent, respectively in the region and individually shared less than 1 per cent in Asia in the year 2000, while share in region of these countries increased in 2017. Meat consumption increased over the years by more than 100 per cent in Kazakhstan, Turkmenistan and Tajikistan, while it increased by about 96 per cent in Uzbekistan in the year 2017 over the year 2000. From the above table it is concluded that meat consumption increased in all Central Asian countries on account of increase in import rather than increased in export.

Net import of meat was more in Tajikistan and Kyrgyzstan as compared to Uzbekistan and Kazakhstan in the region. Except in Kyrgyzstan meat consumption in all countries increased by higher percentage than that increased in the region (93.44 per cent) and in Asia (58.59 per cent) in the year 2017 over the year 2000.All countries in the region require adopting new technology and provide livestock services to the farmers to increase domestic meat production for self sufficiency. Not much variation observed in the effort made by different countries of Central Asia region to increase their meat production as 50 per cent variation is recorded in this regard therein.

Status of per capita meat consumption in different countries of Central Asia region

Per capita meat consumption in different countries of Central region as well as Central region whole and Asia is presented in the Table 5 and also shown in figure 1. The table reveals that, Kazakhstan ranked first with 40.60 Kg / year of per capita meat consumption in the year 2000, which increased by around 27 Kg in the year 2017 to reach the level of about 68 Kg / year and 185.75 gram/day. It was followed by Turkmenistan with per capita consumption of 35.24 kg in the year 2000 which rose to 57.82 Kg/year and 158.41 gram/day in the year 2017. Lowest per capita availability of meat in both the years has been observed in Tajikistan wherein it was 16.59 kg/year (45.45 gram/day) though this country registered highest increase to the extent of around 87 per cent over the year 2000 figure.

In Kyrgyzstan per capita meat consumption remained stable while increase was reported in Uzbekistan and Tajikistan as well in the year 2017. Lowest change in per capita meat consumption is observed in Kyrgyzstan (less than 1 per cent) in the year 2017 over the year 2000. In Kyrgyzstan per capita meat consumption remained almost stagnant, while in rest of countries in the region per capita meat consumption increased during the study period. This region recorded higher increase in per capita consumption during this period compared to that of in the Asia continent. In all the countries in the region human population increased less than the increase in consumption during this study period. Variation in per capita meat consumption almost remain same in both the years i.e., 2000 and 2017, which indicating that all the countries of Central Asia region have made almost the uniform effort to increase their per capita meat consumption during the study period, on the other hand variability in change of all the countries was about 60 per cent, which indicating varying extent of effort made by the countries of Central Asia region during this period of 17 years.

CONCLUSION

Across all countries, meat production in the Central Asian region increased from 15 percent in Kyrgyzstan to 274 percent in Tajikistan between the years 2000 to 2017 due to the increase in the number of animals and poultry. In almost all the countries of the region, growth in poultry sector played major role compared to that of in the number of major animals in increasing per capita consumption of meat during the study period i.e. from the year 2000 to 2017. The increase in the number of major animals ranged from 59.08 per cent (Kyrgyzstan) to 145.11 per cent (Tajikistan), whereas, minimum increase in the number of poultry birds during this period

was also found in Kyrgyzstan by almost same figure of 59.11 per cent and highest to the tune of 577.53 per cent was similarly found in Tajikistan. In Central Asian countries, with the exception of Kyrgyzstan, meat consumption increased by a higher percentage than in the region as a whole (93.44 percent) and in Asia (58.59 percent) in 2017 compared to that of in the year 2000. Per capita consumption of meat was highest (185.75 gram/day) in Kazakhstan while the lowest level (45.45 gram/day) was observed in Tajikistan during 2017. The highest increase of 86.88 percent was found in Tajikistan while, the lowest increase in per capita consumption was found in Kyrgyzstan is less than 1 percent. Though, Tajikistan recorded highest increase in the number of major animals and poultry in the region during this period but far behind in per capita consumption of meat in the region. As there is different requirement of meat for the persons of different age group, gender, food habit, health, etc. this study calls for in-depth study of availability of different types of meat to the individuals of all the groups to ensure food and nutritional security and good health to meet dietary recommendations and accordingly to strengthen the livestock and poultry sector considering sustainable development of different countries of the Central Asia.

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