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Temporal changes in per capita consumption of meat in different countries of South East Asia region[#]

ABDUL WAHID^{1*} and S. K. SRIVASTAVA²

¹*Department of Agricultural Economics and Extension, Sayed Jamaluddin Afghani University, Kunar province, Afghanistan,* ²*Department of Agricultural Economics, College of Agriculture. G.B. Pant University of Agriculture and Technology, Pantnagar (U. S. Nagar, Uttarakhand)*

*Corresponding author's email id: abdulwahid.sultaniaws@gmail.com

ABSTRACT: In South East Asia region rising income, growing population, and increasing urbanization have contributed to growth in livestock production and meat consumption. The study examined the status of production and consumption of meat in different countries of South East Asia region from 2000 to 2017. Descriptive statistics like average, percentage, etc. are used in the study. During this period in South East Asia region, meat production increased about 114 per cent, which was much higher than that of 55.33 per cent increase in Asia continent as a whole, but with a lot of variations across different countries which ranged from 7.61 per cent increase in Singapore to about 574 per cent increase in Myanmar. Highest meat consumption increase was recorded by Myanmar (575.40 per cent), while lowest was in Cambodia (3.61 per cent) during this period. Maximum increase in the per capita meat consumption during 2017 over the year 2000, has been found in Myanmar to the tune of 491 per cent, while lowest increase was registered by Thailand (0.20 per cent).

Key words: Meat production, meat consumption, per capita consumption, South East Asia

The global distribution of the most important species of farmed animals has a wide range of applications in understanding the general social, economic, environmental, and epidemiological and health impacts of the livestock sector. Meat contains quality protein and other essential nutrients that support a healthy diet to most of the human population practicing non-vegetarian food habit. Livestock sector considered as one of the major components of the agriculture sector in many countries, fairly contributes to the gross domestic product (GDP) of the country. Livestock sector contributed 2.5 per cent to GDP of the Asia as whole, while in agriculture GDP it contributed up to 30 per cent (FAO, 2016). Livestock sector was growing at an annual growth rate of 5.6 per cent (Sugiyama *et al.*, 2003). In 2018, China was the largest meat producing country in the world with its lion's share of about 25.74 per cent. Asian countries were found sharing more than 90 per cent of total buffalo meat in the world (Pasha and Hayat, 2012). America and

Asia produced around 78 per cent of total chicken meat in the world. Southeast Asia's poultry production expanded by 56 percent in the last decade, increased from 5.9 million metric tonnes to 9.2 metric tonnes in 2018, and is expected to reach 12.3 metric tonnes by 2028. South-east Asia's rising incomes, growing population, and increasing urbanization have contributed to growth in livestock production and meat consumption, particularly poultry and pork (Lee and Hansen, 2019). 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 the West Asia region compound annual growth rate in production and consumption found varying from (-) 4.54 per cent to 6.69 per cent and (-) 1.29 per cent to as high as 12.60 per cent, respectively, across countries (Wahid and Srivastava, 2022).

[#]*This paper is drawn from the Post Graduate thesis submitted by first author under supervision of the second author*

Instable production affects consumption pattern of families and malnutrition problem in children and pregnant women especially in Asian countries

relying on animal food sources and on the other hand exporters face with income shock which adversely impacting the balance of payment of the country. As in the East Asia region variations in the per cent change of meat production from the year 2000 to the year 2017 was found more than 250 per cent across countries of the region, as this increase ranged from about (-) 40 per cent in Hong Kong to about 46 per cent in South Korea cent (Wahid and Srivastava, 2021). In the East Asia region not much instability had been found in the production and consumption during 2000 to 2017 in all the countries of the region except Mongolia, wherein, more than 20 per cent instability was found in both meat production and consumption (Wahid and Srivastava, 2021). In view of the aforesaid the present study has been under taken for the countries of South East Asia region to examine the extent and change from the year 2000 to the year 2017 in the production and consumption therein to help the stakeholders to plan accordingly.

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 i.e., latest available data at the time of study. To examine the status of meat production and consumption descriptive statistics are used, like average, percentage, etc. for the two periods i.e. for the year 2000 and year 2017. The status of production, consumption and per capita consumption of meat has been examined across countries of the South East Asia region. The changes in human population and major livestock are also worked out to analyze the results. Country wise production data was available in the secondary sources but consumption data was not available. Therefore, availability of given meat product in the country was considered as a proxy to total consumption of the product in that country. Total availability has been worked out as domestic meat production plus net import quantity (total import – total export) in the given year (Wahid and Srivastava, 2022). Total consumption of meat in a country is worked out as,

$$C_{jt} = P_{jt} + I_{jt} - E_{jt}$$

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

Where, C_{jt} = Total consumption of meat in j^{th} country (tonnes) in t^{th} year; P_{jt} = Total production meat in j^{th} country (tonnes) in t^{th} year; I_{jt} = Import of meat in j^{th} country (tonnes) in t^{th} year; E_{jt} = Export of meat from j^{th} country (tonnes) in t^{th} year; PC_{jt} = Per capita consumption of meat in j^{th} country (Kg/year) in t^{th} year; HP_{jt} = Human population in j^{th} country (number) in t^{th} year.

To find the per capita consumption, the unit of total consumption was converted from tonnes to kilograms.

RESULTS AND DISCUSSION

Country wise human population in South East Asia region

Country wise human population in South East 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 South East Asia region in the year 2017 compared to that of the year 2000. Indonesia was the most populous country in south East Asia region in both the years. In the year 2017 highest increase in human population was in Timor Leste by instead of population 40.58 per cent over that of in the year 2000, while lowest increase in

Table 1: Country wise human population in South East Asia region

Sl. No.	Country	Human Population		
		Year 2000	Year 2017	Change over the year 2000 (%)
1	Brunei	12.16	16.01	31.71
2	Cambodia	12.16	16.01	31.71
3	Indonesia	211.51	264.65	25.12
4	Laos	5.32	6.95	30.61
5	Malaysia	23.19	31.10	34.10
6	Myanmar	46.72	53.38	14.26
7	Philippines	77.99	105.17	34.85
8	Thailand	62.95	69.21	9.94
9	Timor-Leste	0.88	1.24	40.58
10	Viet Nam	79.91	94.60	18.38

population is observed in Thailand by 10 per cent during this period. The availability of per capita meat consumption in a country depends on availability of meat and human population. If total meat consumption increases more than the increase in population, per capita meat consumption increases, on the other hand if population increases more than that of total meat consumption, per capita consumption decreases. Therefore, it was important to examine the extent of population change across countries in the region. During 18 year of this study period from 2000 to 2017 minimum proportionate increase in the population has been found in Thailand where it grew by about 10 per cent only. In Viet Nam and Myanmar population increase was less than 20 per cent. In rest of the countries it increased by more than 25 per cent.

Country wise population of major livestock animals and poultry birds in South East 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 countries of the region was 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 South East Asia region for the two years i.e. 2000 and 2017 is presented in the Table 2.

The table reveals that population of poultry birds increased in all the countries of South East Asia region except Timor Leste in the year 2017, while the number of major animals (cattle, buffalo, pigs, goats and sheep) declined in Cambodia, Malaysia and Philippines. The increase in both the poultry birds and major livestock animals is found highest in Myanmar in the year 2017 over the year 2000. The variations in per cent increase during the period across countries were high in both but it is found much higher in poultry birds as this increase ranged from (-) 5 per cent in Timor Leste to more than 540 per cent in Myanmar. This indicates fast increase of poultry sector compared to that of livestock animals in all the countries.

Status of meat production in different countries of South East Asia region

Production of meat in different countries of South East region, South East region and Asia as a whole is presented in the Table 3. The per cent share of different countries in total meat production, depicted in the table, reveals that Viet Nam was the major contributor with its share of 20.76 per cent and 2.18

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

No.	Countries	2000		2017		Change over the year 2000 (%) of Major animals	Change over Poultry the year 2000 (%) birds
		Major animals	Poultry birds	Major animals	Poultry birds		
1	Brunei	0.01	9.67	0.02	17.29	41.17	78.80
2	Cambodia	5.62	20.75	5.52	22.30	-1.87	7.49
3	Indonesia	38.76	888.53	61.01	2225.32	57.38	150.45
4	Laos	3.75	14.89	7.63	40.61	103.32	172.82
5	Malaysia	3.16	128.94	3.08	318.61	-2.45	147.11
6	Myanmar	19.18	52.38	39.90	335.50	108.01	540.48
7	Philippines	22.49	126.02	21.60	187.15	-3.97	48.51
8	Singapore	0.001	2.00	0.00	3.67	30.43	83.45
9	Thailand	13.05	252.84	14.32	290.31	9.74	14.82
10	Timor-Leste	0.61	1.00	0.89	0.95	45.19	-5.00
11	Viet Nam	27.76	211.11	38.11	370.16	37.27	75.34

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

No. Countries / Region	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 Viet Nam	1992412	20.76	2.18	5072358	24.73	3.57	154.58
2 Philippines	2078812	21.66	2.28	3527460	17.20	2.49	69.69
3 Indonesia	1695263	17.67	1.86	3337013	16.27	2.35	96.84
4 Myanmar	467894	4.88	0.51	3153557	15.37	2.22	573.99
5 Thailand	2044484	21.31	2.24	2919962	14.23	2.06	42.82
6 Malaysia	892585	9.30	0.98	1973178	9.62	1.39	121.06
7 Cambodia	199800	2.08	0.22	191262	0.93	0.13	-4.27
8 Lao	73005	0.76	0.08	156868	0.76	0.11	114.87
9 Singapore	112645	1.17	0.12	121220	0.59	0.09	7.61
10 Timor-Leste	23453	0.24	0.03	36209	0.18	0.03	54.39
11 Brunei	15350	0.16	0.02	24262	0.12	0.02	58.06
12 South East Asia	9595702	100.00	10.50	20513351	100.00	14.46	113.78
13 Asia	91355271	-	100	141903358	-	100	55.33

per cent in the East Asia region and Asia, respectively in the year 2000, which increased to the level of 24.73 per cent and 3.57 per cent in the region and in Asia, respectively in the year 2017. Philippines shared 21.66 per cent and 2.28 per cent in the region and Asia, respectively, in the year 2000 which decreased to the level of 17.20 per cent in the region but increased in Asia to 2.49 per cent in the year 2017. Myanmar reported an increase in its share by about three times in the region and Asia, respectively in the year 2017 over the year 2000. In Myanmar, meat production increased highest (around 574 per cent) during the two periods, while, in Viet Nam, Malaysia and Laos, it showed more than 100 per cent increase in this period. In Cambodia it declined by around 4.27 per cent in 2017 over the year 2000. In Myanmar and Laos meat production increased due to increase in number of livestock animals and poultry birds but poultry birds increased more than that of major animals, while in Timor Leste share of livestock animals was more than that of poultry birds in total meat production in the study period. In Cambodia meat production decreased mainly on account of decline in number of livestock animals, while poultry birds increased by less than 10 per cent. The table further reveals that the meat production in the region from the year 2000 to the year 2017 increased with about 114 per cent which was much higher than that of 55.33 per cent increased in the Asia continent. Except Cambodia

all the countries in the region have shown increase in the meat production over the year 2000, with a lot of variation in the per cent change i.e. 7.61 per cent increase in Singapore to about 574 per cent increase in Myanmar. It can be concluded that performance of this region was better than Asia in this regard. Much variation observed in the efforts made by different countries of South East Asia region to increase their meat production as 135 per cent variation is recorded among countries in this regard.

Status of meat consumption in different countries of South East Asia region

Consumption of meat in different countries of South East region of Asia as well as South East region and Asia as a whole is presented in the Table 4. Consumption has been worked out as adding net import of meat to the domestic production of meat in the respective country.

The table reveals that, the proportion of share of South East region increased by around 40 per cent in meat consumption in Asia in the year 2017, over the year 2000, mainly because of increasing share of Viet Nam and Myanmar that rose in the region in Asia. Meat consumption pattern changed in the most of South East Asian countries in this period. Myanmar registered an increase of 575.40 per cent followed by Viet Nam (207.14 per cent) while Indonesia, Malaysia and Laos also showed an

increase of more than 100 per cent. It is found that meat consumption increased in South East Asia region by more than 100 per cent over the year 2000. In Thailand meat production was more than meat consumption, means it exported meat to other countries, while Myanmar was showing almost self-sufficiency in meat production. Rest of countries in the region consumed more meat than that they produced, which indicate that they were the net importing countries in the study period. Much variation observed in the effort made by different countries of South East Asia region to increase their meat consumption as 120 per cent variation is recorded in this regard therein.

Status of per capita meat consumption in different countries of South East Asia region

Per capita meat consumption levels in different countries of South East Asia region, South East Asia region and Asia as a whole have been depicted in the Table 5 and also shown in fig 1.

The highest per capita consumption of meat is found in Singapore in both the years, which was 76.75 Kg in 2000 and 72.95 Kg in the year 2017, followed by Malaysia. Per capita consumption in the region (18.46 Kg /year) was much less than that of Asia (25.78 Kg / year) in the year 2000 but due to much increase in meat consumption (more than 123 per cent) than that of in the Asia (about 59 per cent), per

capita consumption of meat in the region increased to the level (33.34 Kg / year) which was very close to that of in Asia (33.91 Kg / year) in the year 2017. This increase in consumption in the region was more than the increase in human population in the region during this period. The table reveals that per capita meat consumption increased in all the South East Asian countries except Cambodia and Singapore in the year 2017 over the year 2000. Myanmar showed drastic increase in per capita meat consumption of more than 49 Kg followed by Viet Nam (38 Kg) over the figure of the year 2002. Per capita meat

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

No.	Countries/region	Year		
		2000	2017	Change over the year 2000 (%)
		Kg/year	Kg /year	
1	Singapore	76.75	72.95	-4.96
2	Malaysia	45.45	72.05	58.53
3	Viet Nam	24.01	62.28	159.44
4	Myanmar	10.02	59.20	491.10
5	Timor-Leste	31.86	39.56	24.16
6	Philippines	28.66	38.78	35.30
7	Laos	13.71	29.05	111.79
8	Thailand	26.11	26.16	0.20
9	Indonesia	8.24	13.33	61.72
10	Cambodia	16.45	12.94	-21.33
11	Brunei	1.60	2.21	38.42
12	South-East Asia	18.46	33.34	80.60
13	Asia	25.78	33.91	31.55

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

No.	Countries / region	Year						
		2000			2017			
		Consumption (tonnes)	Share in Region (%)	Share in Asia (%)	Consumption (tonnes)	Share in Region (%)	Share in Asia (%)	Change over the year 2000 (%)
1	Viet Nam	1918279	19.79	1.99	5891789	27.25	3.85	207.14
2	Philippines	2235233	23.06	2.32	4078395	18.86	2.66	82.46
3	Indonesia	1743405	17.99	1.81	3527668	16.32	2.30	102.34
4	Myanmar	467946	4.83	0.49	3160508	14.62	2.06	575.40
5	Malaysia	1054142	10.88	1.09	2241117	10.37	1.46	112.60
6	Thailand	1643497	16.96	1.70	1810467	8.37	1.18	10.16
7	Singapore	309216	3.19	0.32	416382	1.93	0.27	34.66
8	Cambodia	199970	2.06	0.21	207189	0.96	0.14	3.61
9	Laos	73008	0.75	0.08	201951	0.93	0.13	176.61
10	Timor-Leste	28178	0.29	0.03	49183	0.23	0.03	74.54
11	Brunei	19409	0.20	0.02	35384	0.16	0.02	82.31
12	South East Asia	9692278	100.00	10.05	21620032	100.00	14.11	123.06
13	Asia	96436811	-	100	153231535	-	100	58.89

consumption increased in Myanmar by around 491 per cent over year 2000, followed by Viet Nam and Laos where it also increased by more than 100 per cent. Singapore and Cambodia showed decline of 4.96 and 21.33 per cent, respectively in the year 2017 over 2000. Though there was decline in per capita consumption of meat in Singapore but still this level was highest in this region. In the year 2000, only in Singapore per capita consumption of meat was more than 50 kg i.e. 76.75 kg per year which reduced to 72.95 kg/year in 2017 but still remained highest in the region. In the year 2017 level of per capita consumption crossed 50 kg/year in four countries viz; Singapore, Malaysia, Viet Nam and Myanmar. Vast difference has been observed from the table in the level of per capita meat consumption which was as low as 2.21 kg/year in Brunei to as high as 72.95 kg/year in Singapore in the year 2017. From the above table, it is concluded that per capita meat consumption declined in Singapore and Cambodia due to the fact that population increase in these two countries was more than the increase in their total meat consumption. In Myanmar Per capita meat consumption increased by highest per cent, while remained almost stagnant in Thailand during the study period i.e. around 26 Kg / year in both the periods. Variation in per capita meat consumption decreased from 82 per cent to 64 per cent in the year 2017, compared to that of year 2000, indicating that all the countries of South East Asia region have not made similar efforts to increase their per capita meat consumption during the study period, on the other hand variability in change of all the countries was high i.e., about 165 per cent, indicating varying extent of efforts made by the

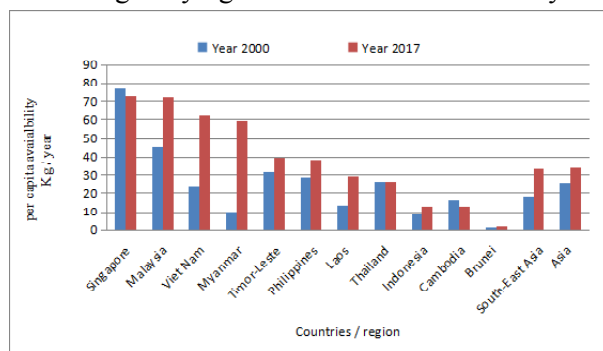


Fig 1: Per capita meat consumption in the countries of South East Asia region (Kg / year)

countries of South East Asia region during this period of 18 years.

CONCLUSION

In South East Asia region, meat production increased about 114 per cent, which was much higher than that of 55.33 per cent increase that of in the Asia continent, but with a lot of variation in the per cent change i.e. 7.61 per cent increase in Singapore to about 574 per cent increase in Myanmar. Meat consumption pattern changed in most of the South East Asian countries, in the year 2017 as highest consumption (23.06 per cent) was shared by Philippines in the year 2000 but in the year 2017 highest share was of Viet Nam (27.25 per cent). Myanmar registered highest increase of (575.40 per cent) followed by Viet Nam (207.14 per cent), while lowest was in Cambodia (3.61 per cent) during this period. In South East Asian countries, per capita meat consumption declined in Singapore and Cambodia due to the fact that population increased more than total meat consumption in these two countries, whereas, in Myanmar per capita meat consumption increased highest at 491 per cent, while lowest increase registered by Thailand (0.20 per cent) during this period. The study suggests that meat production of individual livestock animal and poultry need to be examined in the countries especially; Laos, Thailand, Indonesia, Cambodia and Brunei where per capita consumption is less than 30 kg/year, to accelerate the adoption of new technologies for more production of meat therein. In almost all the countries of the region, growth in poultry sector played major role in increasing per capita consumption of meat during the study period i.e. from the year 2000 to 2017. As there is different requirement for the person of different age group, gender, food habit, health, etc. which calls for in depth study accordingly to strengthen the livestock and poultry sector for providing nutritional diet to the human population.

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