

Trend and Instability in Production and Consumption of Meat: A Study of different countries of West Asia Region

Abdul Wahid¹ and S K Srivastava^{2*}

¹Lecturer, Department of Agricultural Economics and Extension, Sayed Jamaluddin Afghani University, Kunar province, Afghanistan

²Professor, Agricultural Economics, G.B. Pant University of Agriculture and Technology, Pantnagar, India

*Corresponding author: S K Srivastava, Professor, Agricultural Economics, G.B. Pant University of Agriculture and Technology, Pantnagar, India



ARTICLE INFO

Received: 📅 July 06, 2022

Published: 📅 July 19, 2022

Citation: Abdul Wahid, S K Srivastava. Trend and Instability in Production and Consumption of Meat: A Study of different countries of West Asia Region. Biomed J Sci & Tech Res 45(2)-2022. BJSTR. MS.ID.007170.

Keywords: West Asia; Meat Production, Meat Consumption, Growth, Instability

ABSTRACT

Animal origin foods are useful component to most diets which contain high value biological protein and micronutrients like iron and vitamin A, major contributors to a healthy diet. The study examined growth and instability of production and consumption of meat in different countries of West Asia region from 2000 to 2017. For estimation of compound annual growth rates (CAGR) in production and consumption of meat exponential growth function was constructed and Cuddy - Della Valle indices are used to find level of instability in both production and consumption of meat in this study. Meat production grew between CAGR of 0.93 per cent in Saudi Arabia to 6.69 per cent in Turkey while, consumption grew between CAGR of 0.20 per cent in Cyprus to 12.60 per cent in Iraq. The highest production growth has been registered by Turkey (6.69 per cent), while that of consumption is registered by Iraq (12.60 per cent) from the year 2000 to the year 2017. In West Asian countries, Georgia noted medium instability in meat production, whereas, Iraq, UAE, Kuwait and Oman exhibited medium instability in meat consumption in this period.

Introduction

Animal origin foods are useful component to most diets which contain high value biological protein and micronutrients like iron and vitamin A, major contributors to a healthy diet. Globally meat production increased by 1.2 per cent in 2018, China was the largest meat producing country in the world with the production of about 25.74 per cent of total world meat production, followed by EU 14.59 per cent. USA was at third position which produced about 14 per cent. Brazil stands at fourth position with 8.19 per cent. Russia ranked at fifth position with 3.04 per cent of while India ranked at sixth position with production of 2.20 per cent of world meat production [FAO, [1]]. The livestock sector employed at least 1.3

billion people globally and directly support the livelihoods of 600 million poor smallholder farmers in the developing world (Thornton [2]). According to the FAO data, in 2016, livestock contributes 1.68 per cent of world GDP, about 34 per cent of the agricultural GDP. Moreover, livestock sector was contributing 2.5 per cent of total GDP and 30 per cent in of agriculture GDP of Asia continent in the year 2016. Asian countries were shared 91.74 per cent of total buffalo meat in the world (Pasha[3]). The growth in the livestock sector is increasing day by day because of its importance as an alternative source employment and its significant contribution to food security aspects which have consistently exceeded the growth of the crop sector (Zijpp [4]). Demand for higher value and quality

foods such as milk and meat increases more, compared to foods of plant origin such as grains. It is obvious that the production and consumption of animal products are increasing but with variation. Instability in production affects consumption pattern of families and malnutrition problem in children and pregnant women especially in Asian countries relying on animal food sources (Randolph [5]) on the other hand, exporter faces with income shock which adversely affects to the domestic producers also besides, Impacting the balance of payment of the country. In view of the aforesaid the present study was carry out in the countries of West Asia 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. 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. Total consumption of meat product worked out (Wahid [7]) as,

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

Where,

C_{jt} = Consumption of meat in j^{th} country (tonnes) in t^{th} year

P_{jt} = Production of 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 in j^{th} country (tonnes) 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 West Asia region. To estimate growth in production and consumption of meat in West Asian countries, exponential growth function has been fitted for different countries. Growth rates are worked out to examine the tendency of the variable to increase, decrease or stagnate over period of time. It also indicates the magnitude of the rate of change in variable under consideration per unit of time. In present study, compound annual growth rates of production and consumption of meat in West Asian countries have been estimated by using the exponential growth function to the following form,

$$Y_t = ae^{bt}$$

Where,

Y_t is production / consumption of meat in different countries of West Asia region

a and b are constants (parameters)

t is time period from the year 2000 to the year 2017, i.e., 18 years

To examine the level of instability in production and consumption of meat across the countries of West Asia region Cuddy - Della Valle instability indices (CDI) are constructed. Instability index is a sample analytical instrument to find the variation in any given time series data. Cuddy- Della Valle method is used as it corrects the coefficient of variation if data are scattered around the negative or positive trend line, over estimation can be eliminated (Geetha [6]). Formula for the construction of Cuddy – Della Valle index is as follows,

$$I_x = CV \sqrt{((1 - R^2))}$$

Where,

I_x = Index value

Coefficient of variation (CV%) = $(\sigma/\bar{X}) \times 100$

R^2 = Adjusted coefficient of multiple determination

σ = Standard deviation

\bar{X} = Mean value

In the present study the CDI values are grouped into three classes, which represent the different level of instability, as follows:

- Low instability = value of instability index is between 0 to 15.
- Medium instability = value of instability index is more than 15 to 30.
- High instability = value of instability index is greater than 30.

Results and Discussion

Compound Annual Growth Rates in Production and Consumption of Meat in Countries of West Asia Region from 2000 to 2017

(Table 1) depicts the compound annual growth rates of meat production and consumption in different countries of West Asia region from 2000 to 2017. The results show that meat production and consumption both declined in Palestine and Georgia, whereas Cyprus, Lebanon and Syria showed declined in meat production only. The compound annual growth rates of meat consumption were the highest in Iraq and Qatar to the tune of 12.60 per cent and 10.06 per cent per annum, respectively. Meat consumption in United Arab Emirate (UAE) grew by 7.73 per cent per annum followed by Bahrain (7.03 per cent). The highest production growth showed by Turkey (6.69 per cent) followed by Oman (5.97 per cent) and Yemen (5.72 per cent) per annum. The table concluded that

Turkey performed well in the West Asia region, because net export of meat was more during this period. Meat consumption grew more than meat production in Saudi Arabia, Jordan, Iraq, UAE, Kuwait, Oman, Bahrain and Qatar. These countries are required to give

much emphasis on increasing production of livestock meat. The figures 1 to 18 indicate the changes recorded in production and consumption of meat in different countries of West Asia region during from 2000 to 2017.

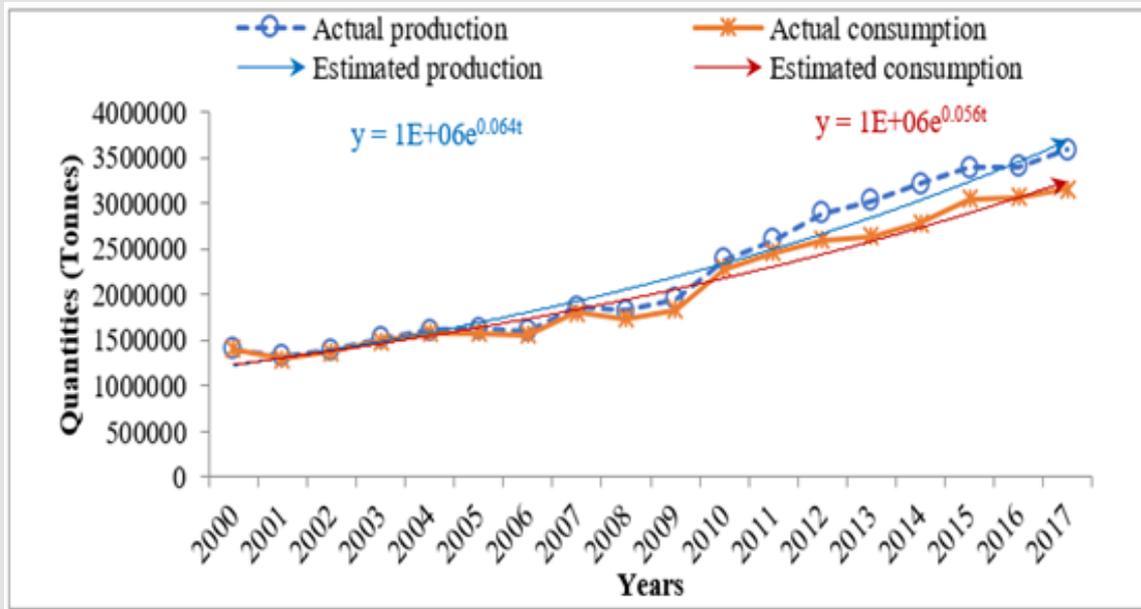


Figure 1: Actual and estimated production and consumption of meat in Turkey.

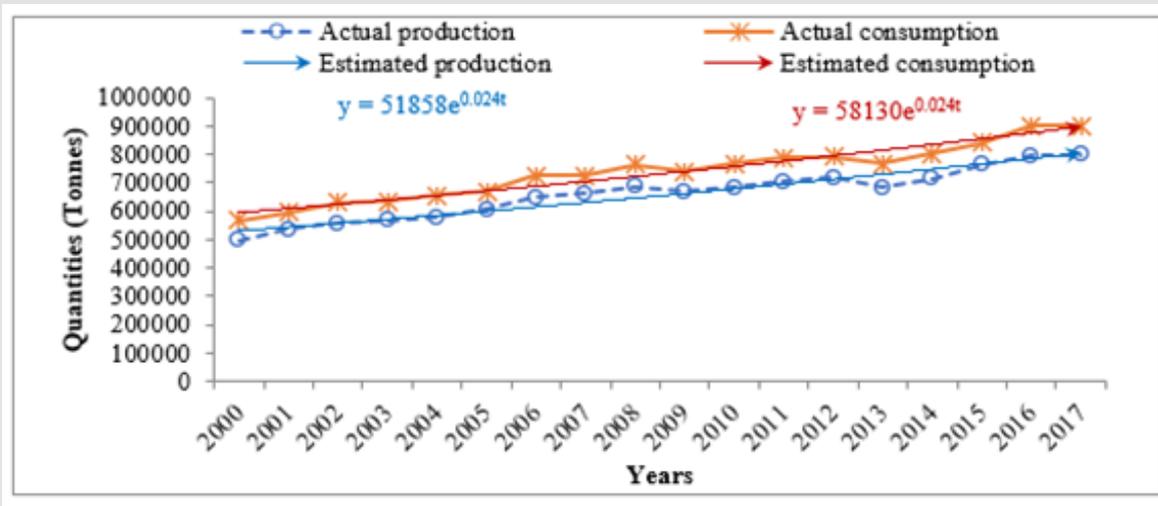


Figure 2: Actual and estimated production and consumption of meat in Israel.

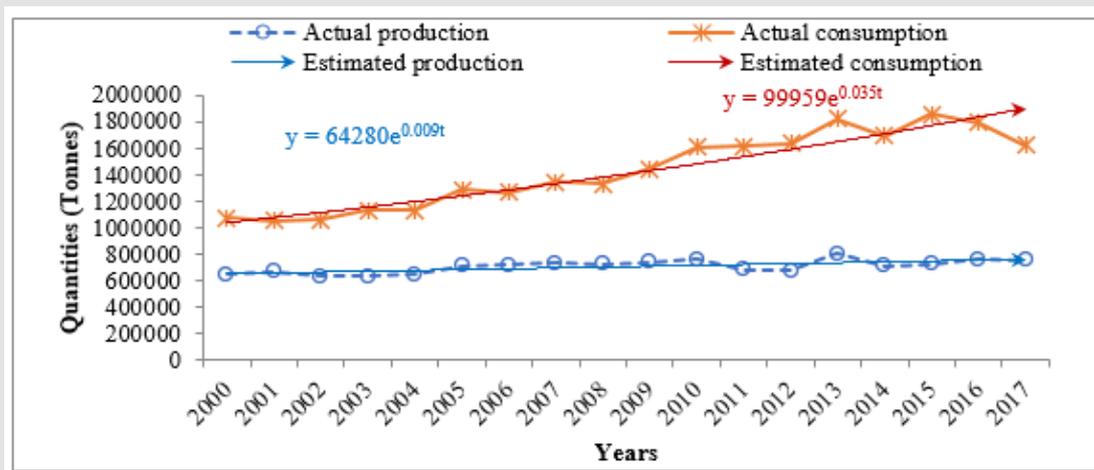


Figure 3: Actual and estimated production and consumption of meat in Saudi Arabia.

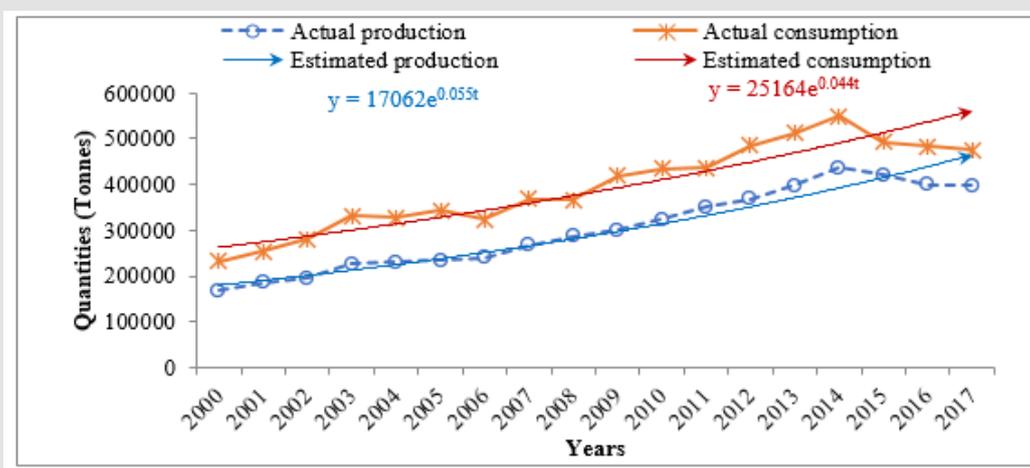


Figure 4: Actual and estimated production and consumption of meat in Yemen.

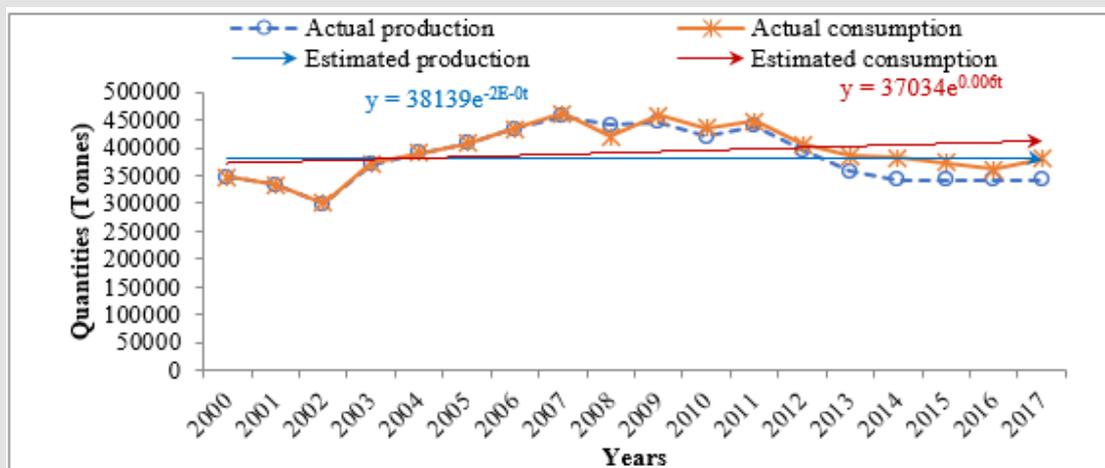


Figure 5: Actual and estimated production and consumption of meat in Syria.

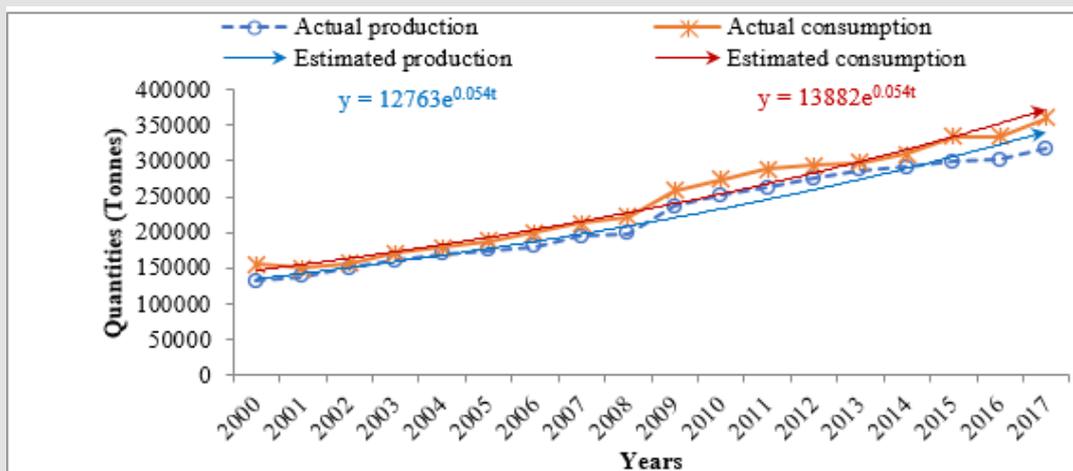


Figure 6: Actual and estimated production and consumption of meat in Azerbaijan.

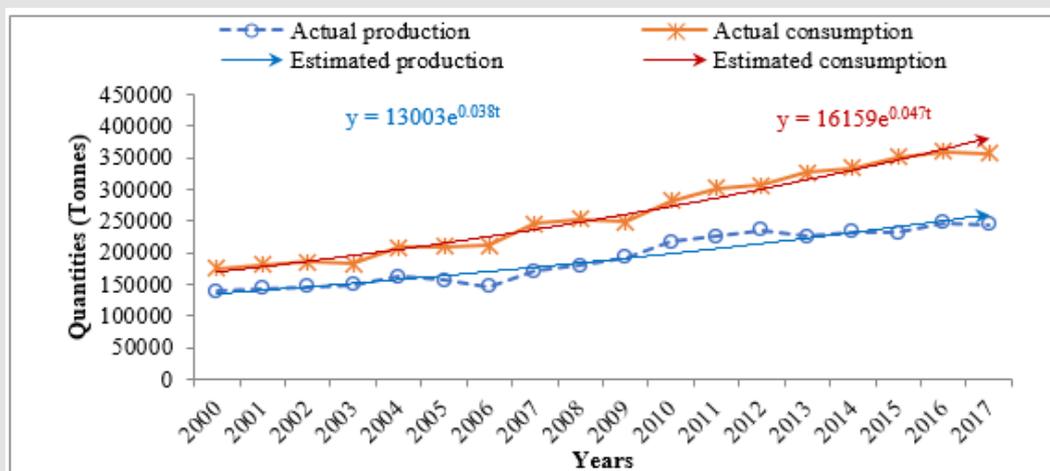


Figure 7: Actual and estimated production and consumption of meat in Jordan.

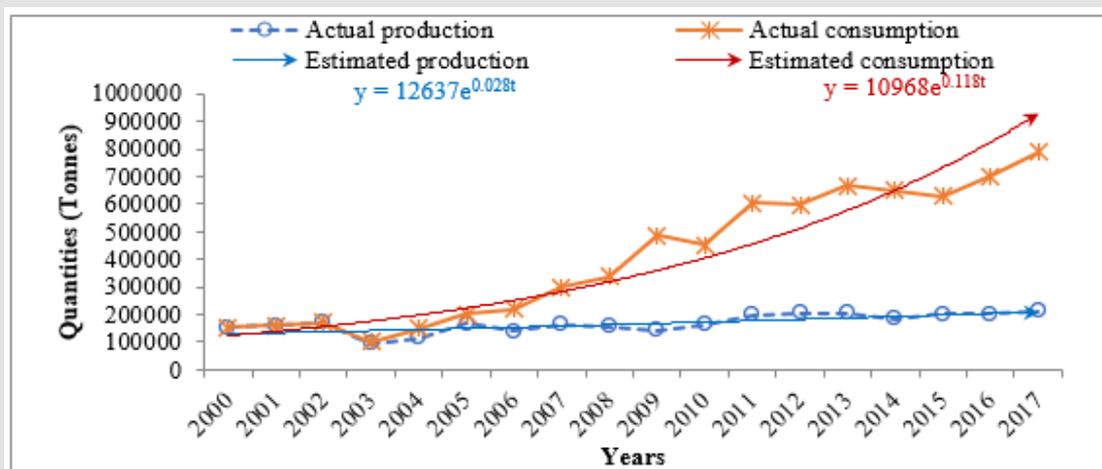


Figure 8: Actual and estimated production and consumption of meat in Iraq.

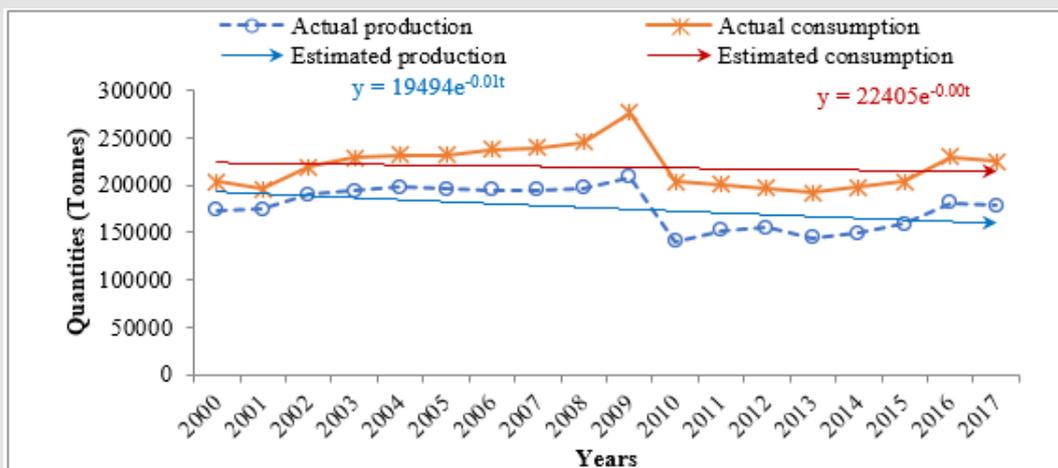


Figure 9: Actual and estimated production and consumption of meat in Lebanon.

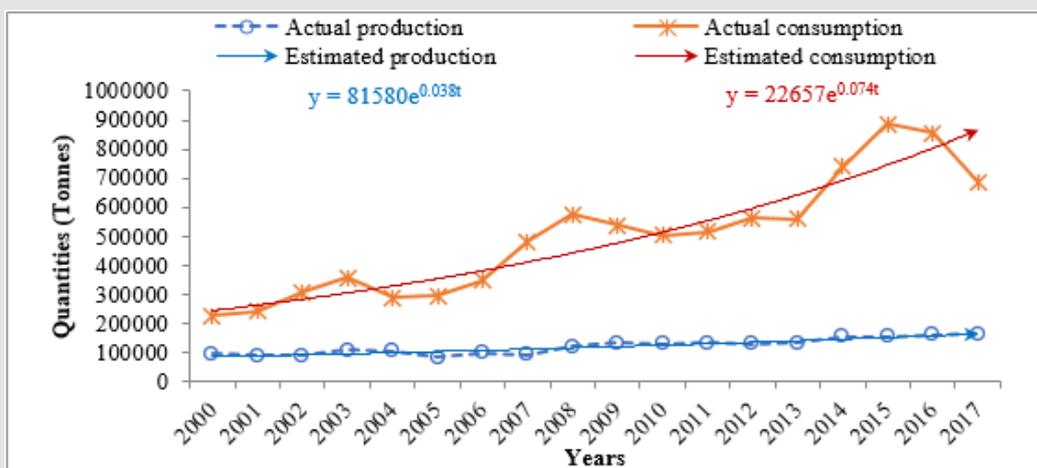


Figure 10: Actual and estimated production and consumption of meat in UAE.

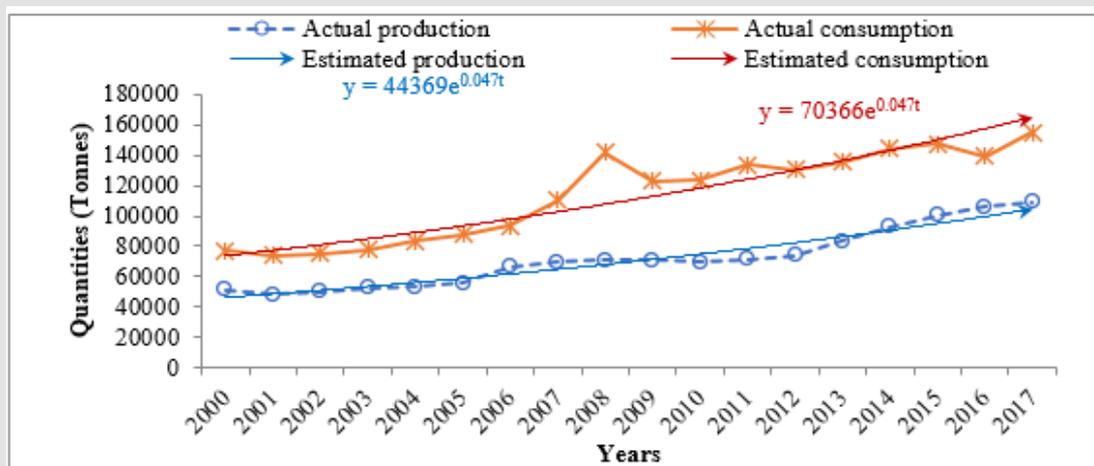


Figure 11: Actual and estimated production and consumption of meat in Armenia.

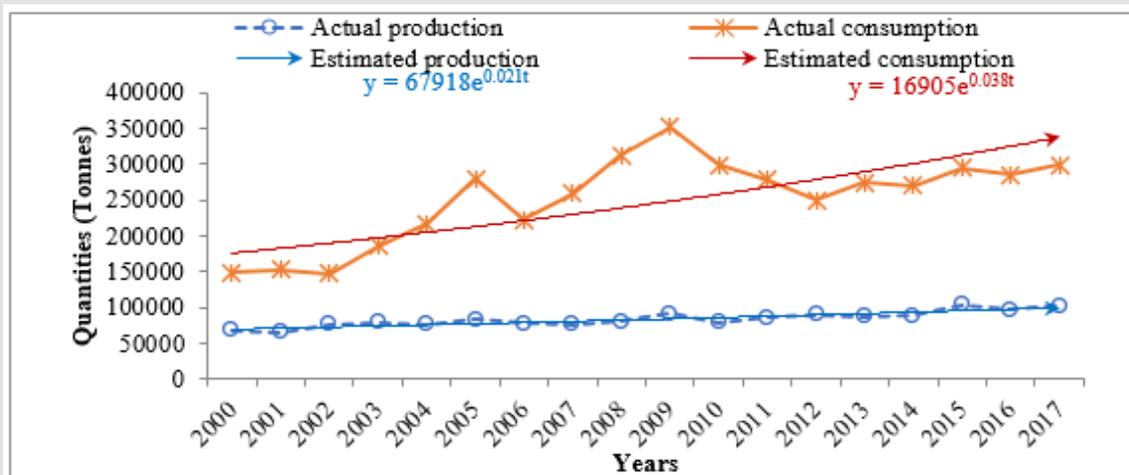


Figure 12: Actual and estimated production and consumption of meat in Kuwait.

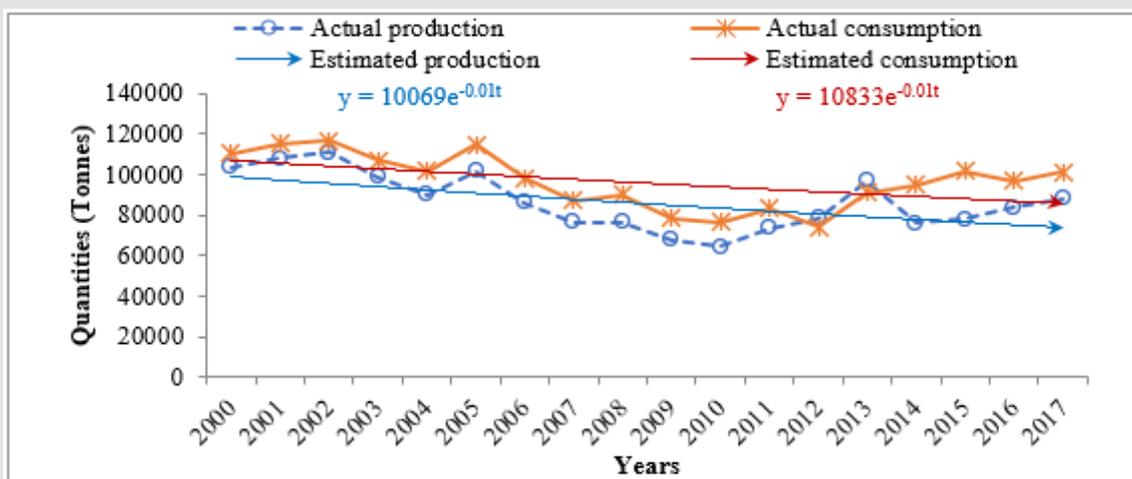


Figure 13: Actual and estimated production and consumption of meat in Palestine.

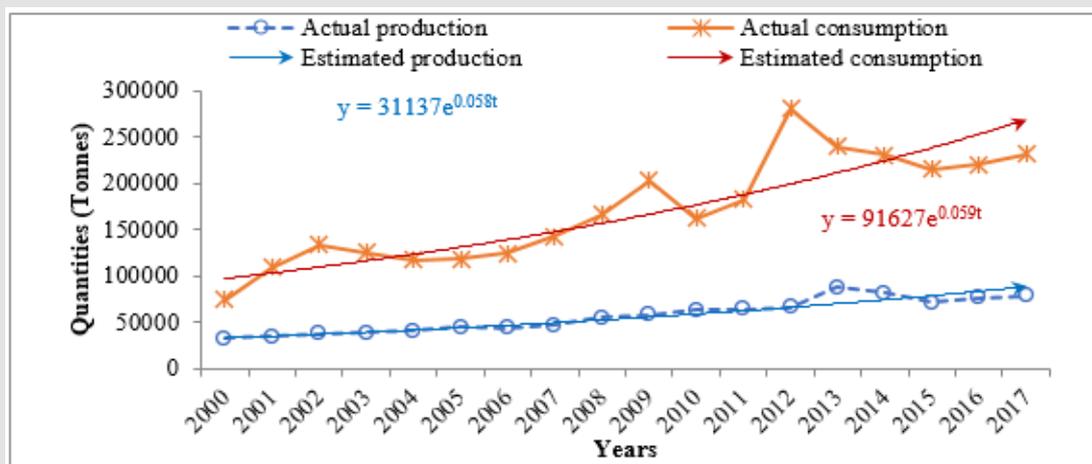


Figure 14: Actual and estimated production and consumption of meat in Oman.

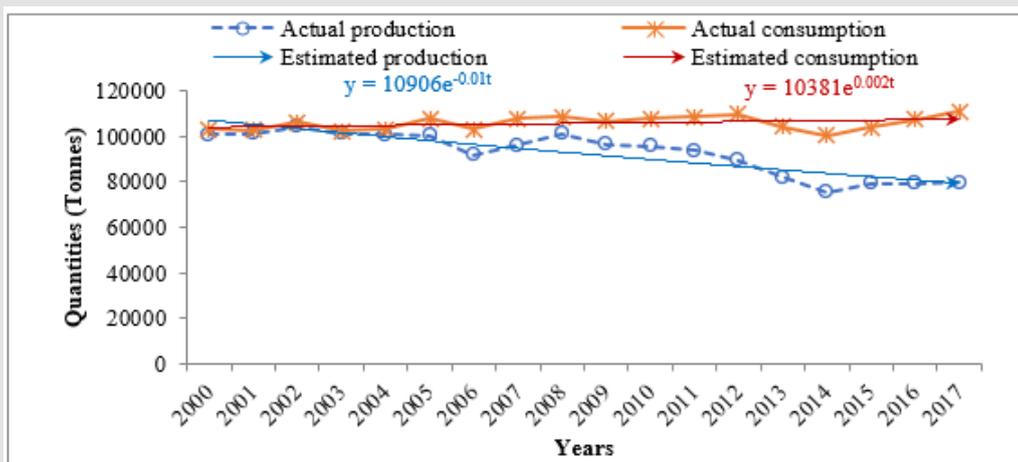


Figure 15: Actual and estimated production and consumption of meat in Cyprus.

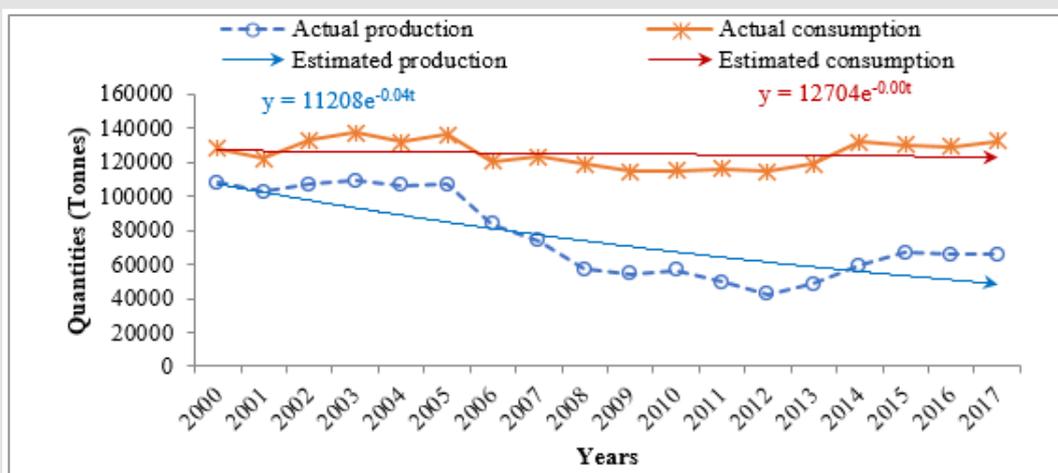


Figure 16: Actual and estimated production and consumption of meat in Georgia.

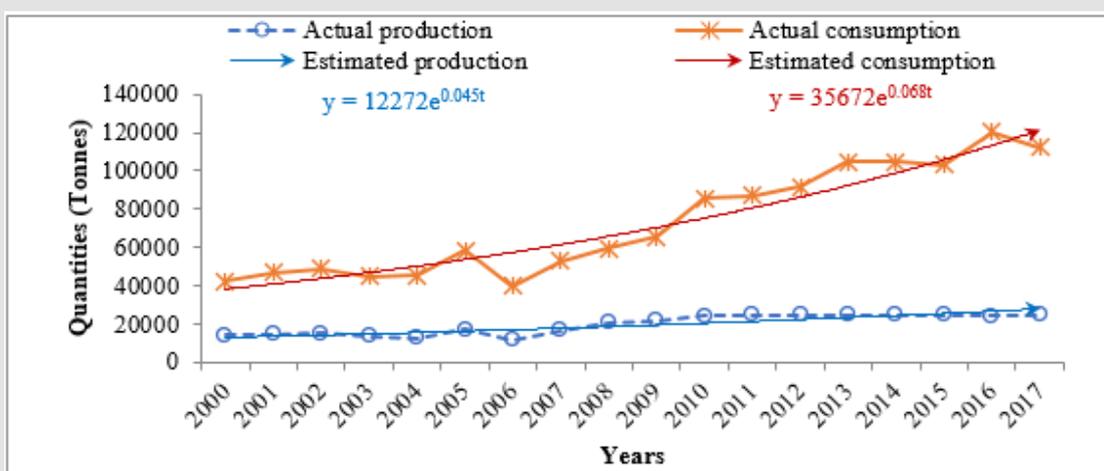


Figure 17: Actual and estimated production and consumption of meat in Bahrain.

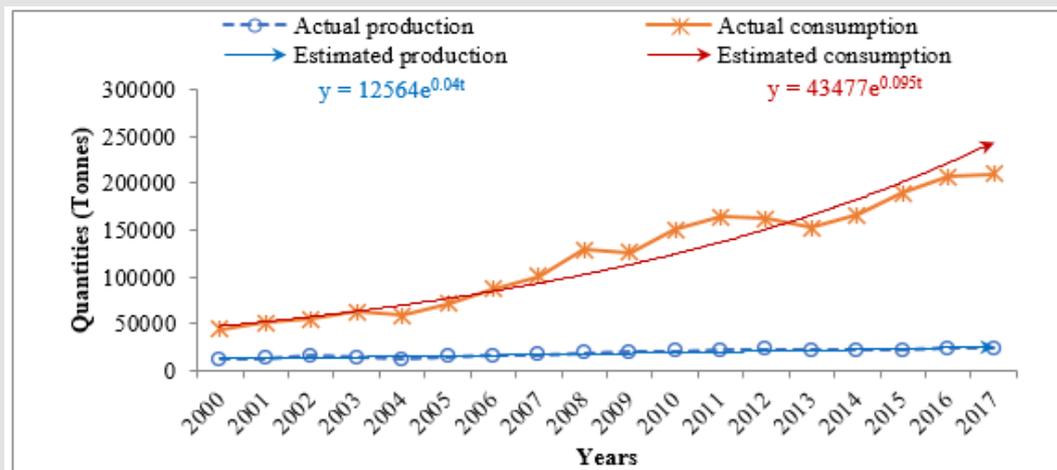


Figure 18: Actual and estimated production and consumption of meat in Qatar.

Table 1: Compound annual growth rates in production and consumption of meat in the countries of West Asia region from 2000 to 2017.

No.	Countries	Production		Consumption	
		Trend Coefficient	CAGR (%)	Trend Coefficient	CAGR (%)
1	Turkey	0.06481* (0.0032)	6.69	0.05682* (0.0029)	5.85
2	Israel	0.02452* (0.0016)	2.48	0.02421* (0.0014)	2.45
3	Saudi Arabia	0.00928* (0.0022)	0.93	0.03575* (0.0027)	3.64
4	Yemen	0.0556* (0.0029)	5.72	0.04459* (0.0038)	4.56
5	Syria	-0.00002NS (0.0058)	-0.002	0.00603NS (0.0051)	0.60
6	Azerbaijan	0.05467* (0.0022)	5.62	0.05488* (0.002)	5.64
7	Jordan	0.03854* (0.0027)	3.93	0.04769* (0.0018)	4.88
8	Iraq	0.02818* (0.0074)	2.86	0.11866* (0.01)	12.60
9	Lebanon	-0.01113** (0.0051)	-1.10	-0.00257NS (0.0046)	-0.25
10	UAE	0.03873* (0.0041)	3.95	0.07444* (0.0065)	7.73
11	Armenia	0.04761* (0.0028)	4.87	0.04732* (0.0042)	4.84
12	Kuwait	0.02112* (0.0025)	2.13	0.03848* (0.008)	3.92
13	Palestine	-0.01718** (0.0061)	-1.70	-0.01296** (0.0057)	-1.29
14	Oman	0.05799* (0.0037)	5.97	0.05977* (0.007)	6.16
15	Cyprus	-0.01757* (0.0023)	-1.74	0.00199NS (0.0012)	0.20
16	Georgia	-0.0465* (0.0097)	-4.54	-0.00182NS (0.0029)	-0.18

17	Bahrain	0.04548* (0.0066)	4.65	0.06797* (0.0061)	7.03
18	Qatar	0.03996* (0.0035)	4.07	0.09586* (0.0055)	10.06

Note: * and **indicate significant at 1 and 5per cent probability levels, while NS indicates non significant coefficient.

Level of Instability in Production of Meat in Different Countries of West Asia Region

The instability indices of meat production for different countries of West Asia region presented in (Table 2). The table indicates that all countries in the West region have exhibited low instability in meat production therein which ranged from 3.21 to 13.66 except Georgia which reported medium instability level of 19.83, during this period.

Table 2: Level of instability in production of meat in different countries of West Asia region.

Level of Instability	Period 2000 - 2017	
	Production	
	Countries	Instability index value
Low instability	Turkey	9.24
	Israel	3.21
	Saudi Arabia	5.07
	Yemen	6.56
	Syria	12.81
	Azerbaijan	4.29
	Jordan	5.99
	Iraq	13.69
	Lebanon	11.10
	UAE	8.54
	Armenia	8.23
	Kuwait	5.66
	Palestine	13.30
	Oman	9.68
	Cyprus	4.756
Bahrain	12.34	
Qatar	6.59	
Medium instability	Georgia	19.83

Level of Instability in Consumption of Meat in different Countries of West Asia Region

The instability indices of meat consumption for different countries of West Asia region presented in table 3. The table depicts that the most of countries of Western region found low instability in their meat consumption during the period which ranged from 2.67 to 13.04, where Kuwait registered medium instability of 16.41 followed by UAE (15.70), Oman (15.59) and Iraq (15.57) from the year 2000 to 2017.

Table 3: Level of instability in consumption of meat in different countries of West Asia region.

Level of Instability	Period 2000 - 2017	
	Consumption	
	Countries	Instability index value
Low Instability	Turkey	7.90
	Israel	3.03
	Saudi Arabia	6.24
	Yemen	7.83
	Syria	11.18
	Azerbaijan	4.25
	Jordan	4.22
	Lebanon	10.39
	Armenia	8.61
	Palestine	12.14
	Cyprus	2.67
	Georgia	6.37
	Bahrain	13.04
	Qatar	8.75
	Medium Instability	Iraq
UAE		15.70
Kuwait		16.41
Oman		15.59

Conclusion

Except Lebanon, Palestine, Cyprus and Georgia production and consumption of meat grew positively in all the countries in the region. Meat production grew between CAGR of 0.93 per cent in Saudi Arabia to 6.69 per cent in Turkey while, consumption grew between CAGR of 0.20 per cent in Cyprus to 12.60 per cent in Iraq. The highest production growth has been registered by Turkey (6.69 per cent), while that of consumption is registered by Iraq (12.60 per cent) from the year 2000 to the year 2017. In West Asian countries, Georgia noted medium instability in meat production, whereas Iraq, UAE, Kuwait and Oman exhibited medium instability in meat consumption in this period. No has shown high instability. The study suggested that meat production of individual livestock need to be examined in the countries to accelerate the adoption of new technologies for more production of meat in all countries, with special emphasis on Palestine, Lebanon, and Cyprus as both meat production and consumption grew negatively in these countries in the region.

Acknowledgment

The first author thanks Indian Council of Agriculture Research for providing financial assistance during his post-graduation in India under the India-Afghanistan fellowship and he also thanks Government of Afghanistan, especially Ministry of Higher Education and Ministry of Agriculture, Livestock and Irrigation for giving him opportunity to avail the fellowship to pursue higher education under this scheme.

References

1. (2017) FAO. Overview of global meat market developments in 2018.
2. Thornton PK (2010) Livestock production: recent trends, future prospects. Philosophical Transactions of the Royal Society B: Biological Sciences 365(1554): 2853-2867.
3. Pasha TN, Hayat Z (2012) Present situation and future perspective of buffalo production in Asia. The Journal of Animal and Plant Sciences 22(3): 250-256.
4. Van der Zijpp, A J (1999) Animal food production: the perspective of human consumption, production, trade and disease control. Livestock Production Science 59(2-3): 199-206.
5. Randolph TE, Schelling E, Grace D, Nicholson CF, Leroy J L, et al. (2007) Invited review: Role of livestock in human nutrition and health for poverty reduction in developing countries. Journal of animal science 85(11): 2788-2800.
6. Geetha RS, Srivastava SK (2019) Performance and determinants of maize production in India. International journal of current research in biosciences and plant biology 6(6): 17-25.
7. Wahid Abdul, Srivastava SK (2019) Growth and Instability in Meat Production and Consumption of Different Countries of East Asia Region. Indian Vet J 98(1): 18-25.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2022.45.007170

S K Srivastava. Biomed J Sci & Tech Res



This work is licensed under Creative Commons Attribution 4.0 License

Submission Link: <https://biomedres.us/submit-manuscript.php>



Assets of Publishing with us

- Global archiving of articles
- Immediate, unrestricted online access
- Rigorous Peer Review Process
- Authors Retain Copyrights
- Unique DOI for all articles

<https://biomedres.us/>