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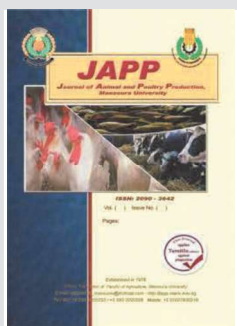
Trends in Livestock Production and Red Meat Industry in Sulaymaniyah Governorate, Kurdistan Region of Iraq: A Review

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ABSTRACT

There are major changes in livestock production and red meat consumption trends throughout the world, particularly in emerging and developing countries due to various factors. The livestock sector as a source of red meat production has significant potential and an important contribution to the agro-economy development of the Kurdistan region of Iraq. Most of the farm animals are reared in the Sulaymaniyah governorate. Mainly, Cattle (6.7%), Sheep (72.45%), goats (20.7%), and buffalo (0.15%) are the most farm animals in the Sulaymaniyah governorate. Although The area has vast pastures which can make it capable to make progress in the livestock industry, currently livestock farming is declining and the number of large and small ruminants has decreased meanwhile importing animals from abroad for red meat has increased to meet the market demand. Furthermore, a further decline in the number of small and large ruminants may harm the sustainability of the agricultural sector Kurdistan region in general and in particular Sulaymaniyah governorate. This paper reviews ten years (2009 to 2018) records of slaughtered cattle, sheep and goats in Sulaymaniyah governorate, Kurdistan region – Iraq aiming to determine trends in production and consumption patterns of red meat products in Sulaymaniyah city, Kurdistan region and identify opportunities for developing livestock production industry in Kurdistan region.

Keywords: Livestock, red meat, meat consumption, beef, cattle, sheep, goat, Sulaymaniyah, Kurdistan Region

INTRODUCTION

Sulaymaniyah is a mountainous Governorate with 15 districts located in the Kurdistan region, northeast of Iraq, on the border with Iran. Sulaymaniyah's climate is hot and dry in the summers and rainy and cold in the winters. Sulaymaniyah is rich and large in terms of land (total area 1,844,884ha, arable lands 607,972 ha) which host the fertile plains of Sharazur and Bitwen, and rich in water resources, this gave a great capacity to this region to grow various crops and rear various animals (Sleman.gov.krd, 2019).

Historically, the Kurdistan region of Iraq is a cradle and heartland of some animal and plant domestication (Braidwood and Braidwood, 1950, Olsen, 1979, Zeder, 2008). Animal Production has occupied an important part of the Kurdistan region's agricultural economy. Both ruminants and non-ruminants are reared in the Kurdistan region. The ruminants which are mainly reared in Kurdistan are Cattle, Sheep, goat, and water buffalo. Livestock production in the Kurdistan region is mostly done under extensive systems due to the availability of a big area of natural pasture (1,734,418.5 hectares) in the region (KRSO, 2017a). Livestock has a very important role in rural livelihoods and agricultural economy of developing countries which provides a direct cash income for the farmers and other working value chains (Sansoucy, 1995, M. Herrero, 2012).

Most human societies, during most of their histories, have valued the eating of meat as a cherished social activity contributing to the health and overall wellbeing (Smil, 2013). Meat is one of the most significant, nutritious, and

favorable available food items, which aids in fulfilling most of their body requirements. Meat is an important source of high-quality protein, minerals, vitamins, and micronutrients that are needed for good health throughout life (Sansoucy, 1995, Williams, 2007, Arshad, 2018). Eventhough red meat, especially lamb meat, is considered as a major ingredient in Kurdish cuisine (Barzinji, 2015), but the information on customer demand has not been quantified in the region yet.

The livestock sector has significant potential and an important contribution to the agricultural economic development of the Kurdistan region of Iraq. Mainly, Livestock industry products in the Kurdistan region are meat, milk, skin, and fibers. Sulaymaniyah governorate has the biggest share in animal farms of the region. Mainly, Cattle (6.7%), Sheep (72.45%), goats (20.7%), and buffalo (0.15%) are the most common farm animals in these two major governorates. Though these areas have vast natural pastures (1,120,127 ha) which can make it capable to make progress in livestock industry (KRSO, 2017a), currently, livestock farming is declining and the number of large and small ruminants has decreased meanwhile importing animals from abroad for red meat has increased to meet the market demand. Furthermore, a further decline in the number of small and large ruminants may harm the sustainability of the agricultural sector Kurdistan region in general and in particular Sulaymaniyah governorate.

This review paper highlights the major development and changes in red meat production sector during nine years (2009 to 2018) in Sulaymaniyah governorate, aiming to determine the trends in production and consumption patterns of red meat products and identify opportunities for

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developing livestock production industry in Kurdistan region.

2- Livestock and red meat industry in Sulaymaniyah Governorate:

Importance of Livestock industry

The livestock sector has significant potential and an important contribution to the agricultural economic development of the Kurdistan region of Iraq. Livestock products are important sources of rural household income and profitable for farmers. Mainly, Livestock industry products in the Kurdistan region are meat, milk, skin, and fibers. Sulaymaniyah governorate has the biggest share in animal farms of the region. Mainly, Cattle (6.7%), Sheep (72.45%), goats (20.7%), and buffalo (0.15%) are the most common farm animals in this major governorate. Sulaymaniyah governorate has vast natural pastures (1,120,127 ha) which can make it capable to make progress in livestock industry (KRSO, 2017b), Ministry of planning of Kurdistan regional Government ministry (KRG) in 2013 had set a vision for future as an objective for rebuilding Kurdistan region infrastructure, more attention had been paid to agricultural industry development and more specifically livestock production development in the region (KRG, 2013). In Sulaymaniyah governorate, the majority of livestock is kept by smallholders. Recently, Sulaymaniyah people's demand for meat has increased significantly which can be a key factor to promote the development of sustainable and profitable smallholder livestock production. Livestock contributes 40% of the global value of agricultural output and supports the livelihoods and food security of almost 1.3 billion people (National-Research-Council, 2015).

Population Trends in Sulaymaniyah Governorate

Table (1) shows that the human and livestock population have both grown in the Sulaymaniyah governorate over the past ten years at different rate percentages. The human population has increased by 30.5% between 2009 and 2018 and change in the ruminant population also grown considerably. The population of large ruminants has increased by 9.73% only, while small ruminants have increased by 86.83%. Small ruminant mainly includes sheep in this growth rate due to high consumption demand on lamb meat.

Table 1. Annual Growth rate of human and livestock population in Sulaymaniyah Governorate

| Year | Human Population | Large ruminant | Small ruminant |
|-------------------------------|------------------|----------------|----------------|
| 2009 | 1,797,508 | 140,740 | 1,032,696 |
| 2010 | 1,851,433 | 150,679 | 1,164,876 |
| 2011 | 1,906,976 | 134,771 | 1,317,826 |
| 2012 | 1,964,186 | 160,112 | 1,827,389 |
| 2013 | 2,023,111 | 138,008 | 1,461,316 |
| 2014 | 2,083,040 | 178,016 | 1,551,188 |
| 2015 | 2,146,708 | 172,120 | 1,645,760 |
| 2016 | 2,211,109 | 166,224 | 1,740,332 |
| 2017 | 2,277,442 | 160,328 | 1,834,904 |
| 2018 | 2,345,765 | 154,432 | 1,929,476 |
| Change % | 30.50 | 9.73 | 86.83 |
| Average of Annual Growth Rate | 3.30 | 1.88 | 8.13 |

The average annual growth rate for the human population, large ruminants, and small ruminants were 3.3%, 1.88%, and 8.13% respectively. This data shows that Livestock number has grown at a faster rate than the human population in Sulaymaniyah governorate between 2009 and 2018.

Red meat industry in Sulaymaniyah Governorate

All the data related to meat production in Sulaymaniyah have been obtained from the General

Directorate of Veterinary of Sulaymaniyah. Table (2) and Figure (1) illustrate the trends of red meat production by the number of slaughtered large and small ruminants (namely; Cattle, Sheep, and Goat) between 2009 and 2018 in the slaughterhouses located in Sulaymaniyah governorate. The data show a steady increase in the number of slaughtered cattle and goats for meat production while the number of sheep slaughtered has dramatically risen in 2012 and continually rose until 2018.

Table 2. Annual growth of Livestock meat production in Sulaymaniyah Governorate (2009-2018)

| Year | Cattle | Sheep | Goat |
|---------------------------------|---------|-----------|---------|
| 2009 | 140,740 | 746,515 | 286,181 |
| 2010 | 150,679 | 817,270 | 347,606 |
| 2011 | 134,771 | 951,407 | 366,419 |
| 2012 | 160,112 | 1,413,627 | 413,762 |
| 2013 | 138,008 | 1,054,412 | 406,904 |
| 2014 | 178,016 | 1,150,141 | 401,047 |
| 2015 | 172,120 | 1,227,017 | 418,743 |
| 2016 | 166,224 | 1,303,893 | 436,439 |
| 2017 | 160,328 | 1,380,769 | 454,135 |
| 2018 | 154,432 | 1,457,645 | 471,831 |
| Change % | 9.72 | 95.26 | 64.49 |
| Average of Annual Growth Rate % | 1.88 | 8.83 | 5.92 |

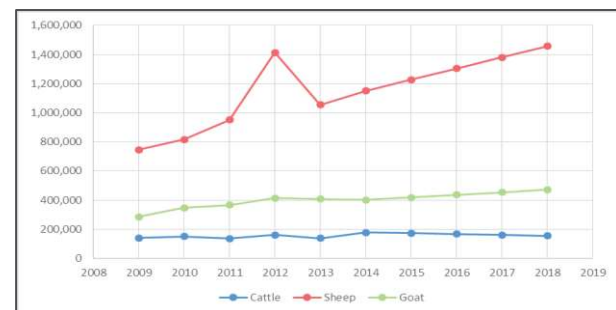


Figure 1. Livestock meat production trends in Sulaymaniyah Governorate

The annual growth rate of Slaughtered cattle, sheep, and goat were 1.88, 8.83, and 5.92 percentages respectively. Additionally, the total change percentages between 2009 and 2018 were 9.72%, 95.26%, and 64.49% respectively (see table 2). These data show bigger growth in small ruminant meat production by higher demand on these kinds of meat compared with cattle. This phenomenon needs to be studied to quantify this information on the consumption demands of red meat by consumers in the Sulaymaniyah governorate. Furthermore, farmers' habit and preferability in rearing small ruminants rather than large ruminants is another factor of that significant growth in sheep and goat meat production compared with cattle.

These major changes in red meat production trends can be connected to some major reasons in Kurdistan region in general, and Sulaymaniyah Governorate in specific. These factors are: the climate of this region mainly annual precipitation rate has a big effect on natural pastures, the recent change in this region's climate has caused a serious drought in the region which has caused the disappearance of many springs and small rivers; instability of animal feed price; population growth; meat price; demand on livestock products in the market; increasing the purchasing power of people; financial crisis (Thornton, 2010, USAID, 2008); and the trade and movement of the animals from Sulaymaniyah to other governorates and neighbor countries such as Iran and turkey (often involved in contraband)(Global Initiative, 2019); Additionally, some special circumstances may lead to increase slaughtering ruminant animals for

ritual slaughter for treating a sick person, especially for well-known people.

Carcass weight refers to the weight of an animal after being partially butchered, removing all the internal organs and oftentimes the head as well as inedible (or less desirable) portions of the tail and legs. The distribution of the carcasses according to carcass weight and ruminant species is presented in Table (3). Slaughtered Cattle, sheep and goat weighing 150, 21, 17 kg respectively in Sulaymaniyah Governorate.

Domestic red meat production (tonnes) is shown in table (4) and figure (2). Beef and sheepmeat production were increased 174% and 237% respectively between 2009 and 2018 while goat meat production was decreased 63% between 2009 and 2018. The average annual growth rate for Beef, sheep and goat meat were 12.34%, 15.91%, and -

Table 4. Local Livestock Meat production (tonne) in Sulaimani Governorate (2009-2018)

| Product | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | Change % | Average of Annual Growth rate |
|----------------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|----------|-------------------------------|
| Beef | 7557 | 4688 | 4442 | 7636 | 9328 | 16783 | 13313 | 11246 | 12698 | 13155 | 174 | 12.34 |
| Sheep | 5012 | 2878 | 3278 | 5194 | 6442 | 11996 | 12661 | 11929 | 11997 | 11889 | 237 | 15.91 |
| Goat | 1668 | 843 | 989 | 1299 | 1375 | 1610 | 1218 | 954 | 987 | 1051 | -63 | -13.94 |
| Total Red Meat | 14237 | 8409 | 8709 | 14129 | 17145 | 30389 | 27192 | 24129 | 25682 | 26095 | --- | --- |

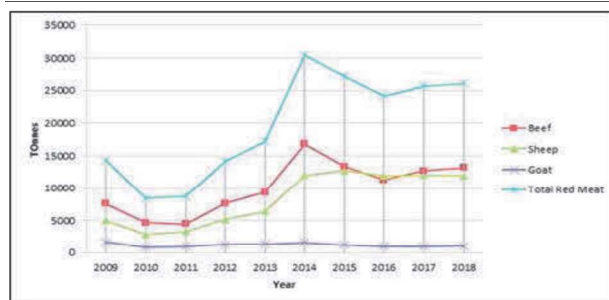


Figure 2. Local Livestock Meat production (2009-2018)

Recently slow growth in domestic red meat production and rapid growth in the demand for red meat has caused a shortage of red meat and prices to increase in Sulaymaniyah market. Due to this high demand for red meat in the Sulaymaniyah governorate, to prevent red meat price hike, some living breed cattle were imported from east European countries, namely; Ukraine, Moldova, Georgia, Romania and Armenia. Table (5) shows the number of cattle imported from Ukraine, Moldova, Georgia, Romania and Armenia between 2014 and 2018. The number of cattle imported from these countries varies annually. The highest

Table 6. Imported frozen red meat (tonne) from 2009-2018.

| Type Frozen meat | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| Veal | 479 | --- | 598 | 583 | 364 | 668 | 240 | 424 | 2497 | 1546 |
| Lamb/Mutton | --- | 1150 | 50 | 31 | 176 | 41 | --- | --- | --- | 22 |
| Total | 479 | 1150 | 648 | 614 | 540 | 709 | 240 | 424 | 2497 | 1568 |

Table 7. Per capita consumption of livestock products (kg/year) between (2009 to 2018)

| Year | Red Meat (kg/year), |
|--------------------------------|---------------------|
| 2009 | 8.19 |
| 2010 | 5.16 |
| 2011 | 4.91 |
| 2012 | 7.51 |
| 2013 | 8.84 |
| 2014 | 14.98 |
| 2015 | 12.80 |
| 2016 | 11.10 |
| 2017 | 12.4 |
| 2018 | 11.80 |
| Change % | 44.07 |
| Average of Annual Growth Range | 8.59 |

13.94% respectively. This data shows that beef and sheepmeat production has grown at a relatively high rate whereas goat meat production has declined in the Sulaymaniyah governorate between 2009 and 2018. Demand for beef and sheepmeat and less preferability of goat meat were the determinants of higher beef and sheepmeat production and less goat meat production (Barzinji, 2015).

Table 3. Average of Livestock carcass weight in Sulaymaniyah Governorate

| Species | Carcass Weight (kg) |
|---------|---------------------|
| Cattle | 150 |
| Sheep | 21 |
| Goat | 17 |

number of imported living cattle was 47,589 heads in 2016 while the lowest number was 1893 heads in 2015.

Table 5. Number of Living Cattle breeds imported from east European countries between 2014-2018

| Partner Country | Year / Quantity (Head) | | | | |
|---------------------------|------------------------|------|-------|-------|-------|
| | 2014 | 2015 | 2016 | 2017 | 2018 |
| Imported Cattle from | | | | | |
| Ukraine, Moldova, Georgia | 3812 | 1893 | 47589 | 24114 | 36021 |
| Romania and Armenia | | | | | |

Additionally, Frozen red meat of veal, lamb and mutton were also imported to Sulaymaniyah. The amount of imported frozen red meat is relatively low. Frozen veal meat has tripled between 2009 and 2018 while imported frozen mutton meat decreased 98% between 2010 and 2018 (Table 6).

As shown in table (7) and figure (3) per capita red meat consumption has increased from 8.9 kg in 2009 to 11.8 kg in 2018. These data show slight growth in red meat consumption due to a decrease in the per capita income in the Kurdistan region and an increase in the price of meat. Income has a big impact on the demand for livestock products (Thornton, 2010, Akbay and Boz, 2005)

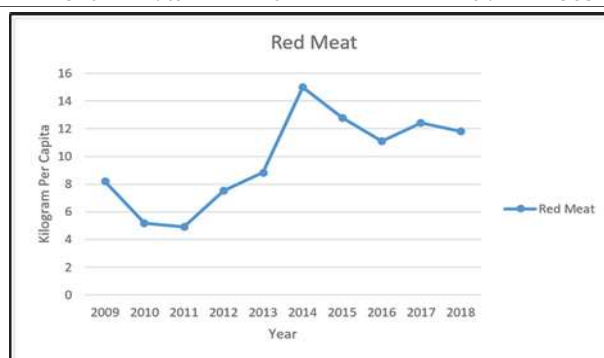


Figure 3. Per capita consumption of livestock products (kg/year) between (2009 to 2018)

CONCLUSION

In this review it was observed that livestock number has grown at a faster rate than the human population in Sulaymaniyah governorate between 2009 and 2018, meanwhile, the quantity of red meat production and per capita consumption have relatively increased in the Sulaymaniyah governorate. The annual per capita consumption of red meat over the different species was varied and the consumers most preferred beef and lamb rather than goat meat which has resulted in declining in goat meat production between 2009 and 2018. The outlook for income growth was the major determinant resulting in relatively slower growth in red meat consumption. Red meat production is still insufficient and it doesn't match the consumption demand of Sulaymaniyah governorate markets which has led to the importation of living cattle and frozen red meat from abroad. A further decline in the number of small and large ruminants may harm the sustainability of the agricultural sector in the Sulaymaniyah governorate. The increasing demand for livestock products continues to be a key opportunity for agricultural economic growth and interest in animal wealth should be taken into consideration specifically. In Kurdistan region generally and in Sulaymaniyah governorate more specifically, there are adequate natural resources and economical potentialities that can be exploited to achieve self-sufficiency in meat production.

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اتجاهات الإنتاج الحيواني وصناعة اللحوم الحمراء في محافظة السليمانية ، إقليم كردستان العراق: مراجعة

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هناك تغييرات كبيرة في الاتجاهات وأنماط استهلاك اللحوم الحمراء والإنتاج الحيواني في جميع أنحاء العالم، لا سيما في البلدان الناشئة والنامية، بسبب عوامل مختلفة. إن القطاع الثروة الحيوانية، كمصدر لإنتاج اللحوم الحمراء، يتمتع بإمكانات كبيرة ومساهمات مهمة في تنمية الاقتصاد الزراعي في إقليم كردستان العراق. إن معظم حيوانات المزرعة المرباة في إقليم كردستان العراق موجودة في محافظة السليمانية. وتعتبر الأبقار (6.7٪) والأغنام (72.45٪) والماعز (20.7٪) والجاموس (0.15٪) من أكثر الحيوانات الزراعية في هذه المحافظة. على الرغم من وجود مراعي شاسعة في هذه المحافظة الذي يمكن أن تجعلها قادرة على تقديم إنتاج وصناعة الثروة الحيوانية، هناك تناقص في تربية المواشي وانخفاض كبير في عدد الحيوانات المجترة الكبيرة والصغيرة في هذه المنطقة وفي نفس الوقت ازداد استيراد الحيوانات من لتلبية طلب السوق. إن المزيد من الانخفاض قد يضر باستدامة القطاع الزراعي في إقليم كردستان العراق بشكل عام ومحافظة السليمانية بشكل خاص. توضح هذه الدراسة بيانات إنتاج وصناعة الثروة الحيوانية لعشر سنوات (2009 إلى 2018) الخاصة ببيع الأبقار والأغنام والماعز في محافظة السليمانية بهدف تحديد الاتجاهات في أنماط إنتاج واستهلاك منتجات اللحوم الحمراء وتحديد فرص تطوير الإنتاج الحيواني في هذه المنطقة.