International Journal of Global Sustainability
ISSN 1937-7924
2022, Vol. 6, No. 1

Meat Production and Consumption Trends on the Western Highlands of Cameroon: evidence from the Menoua

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Received: November 20, 2022 Accepted: December 9, 2022 Published: December 13, 2022

doi:10.5296/ijgs.v6i1.20543 URL: https://doi.org/10.5296/ijgs.v6i1.20543

Abstract

Meat constitutes an important source of protein in human diet. Meat production and consumption varies within and among nations according to variable factors attributed to consumers and their environment. This paper assesses meat production and consumption trends on the Western Highlands of Cameroon, with evidence drawn from the Menoua Division. Of the eight subdivisions in Menoua, four were chosen purposively, namely Dschang, Santchou, Penka-Michel, and Nkong-Ni because these are areas with the presence of slaughterhouses and slaughter slabs where different types of livestock are slaughtered, purchased, and consumed. The paper hypothesises that Meat production has significant relationship with consumption trend in Menoua Division. A combination of purposive, simple random and cluster sampling techniques was used in selecting respondents and resource

persons. The sample size was 302 households and 92 resource persons. Data collection was via structured and pre-tested questionnaires and interview guide. Excel and Statistical Package for Social Sciences (SPSS) version 20 were used for data entry and analysed from the questionnaires. Data from interviews were subjected to thematic analysis. The hypothesis was tested with multiple correlation statistics at 0.5 alpha levels. Findings revealed that highest numbers of livestock slaughtered in the Division is in Dschang with 49.3% cattle and up to 54.6% pig slaughtered annually. The lowest rates were recorded at Nkong-Ni with just 3.5% of cattle and 10.0% pig slaughtered. This increase production trend also reflects a rise in the quantity of meat consumed in the Menoua. The test of hypothesis revealed a calculated P-value of .000* indicating significant positive correlation between Meat production and consumption trends in the Menoua. Key issues surrounding this activity include amongst others the use of doubtful water sources and slaughtering in unhygienic environments. The paper strongly recommends that existing environmental protection regulations should be enforced to curb problems of meat production activities in Cameroon and the Menoua Division in particular to ensure sustainable supplies of wholesome meat to consumers.

Keywords: Meat production, Consumption trends, Cameroon, Western Highlands, Menoua

1. Introduction

The world over, meat constitutes an important source of protein to all humans. Meat consumption varies within and among nations according to variable factors attributed to consumers and their environment. Nations are diverse in terms of economic factors affecting food demand, including population, income and urbanization. Regmi (2002) is of the view that the unprecedented growth in human population and income status that have occurred in the last half century has created an additional demand for meat and in general, food in developing countries. The increasing human population in the face of inelastic production appears to have widened the demand-supply gap and thereby accentuating societies need for meat products. Hence society suffers a shortage of meat supply.

The significance of Studies on meat production and consumption trends for a country like Cameroon and the Menoua Division in particular are expected to reveal the dynamics of qualitative and quantitative meat needs and provide indices on which sustainable nutritional strategies could be based. Cameroon produces different volumes of meat depending on the different type of species. Overall, different types of species (cattle, goats, sheep, poultry, pigs) are raised throughout all the regions of the country; however, with less than 100 t produced on yearly basis, goat production is negligible in the South, West and East Regions (Annuaire Statistique du Cameroun, 2015).

Meat production is an important part of the world economy with important contributions to local, national, and international trade. There may be multiple paths to the future of meat production. FAO (2019) considers meat as the flesh of animals used for food. As reported by individual countries, meat production data may refer either to commercial production (meat entering marketing channels), inspected production (from animals slaughtered under sanitary inspection), or total production (the total of the above- mentioned categories plus slaughter for personal consumption). In 2019, total production of meat for Cameroon was 307,151

tonnes. Total production of meat of Cameroon increased from 89,255 tonnes in 1970 to 307,151 tonnes in 2019 growing at an average annual rate of 2.64%.

Meat has been a staple food and under high demand since prehistoric era (Eaton and Konney, 1985). Many researchers have noted that meat has played a tremendous role in our diets and the role of meat has been prominently discussed when talking about food trends (Sulley, 2006; Adzitey, 2013). Meat has equally been considered by most nutritionists as an essential part of a well balance diet due to its complete proteins (Adams, 1995).

The choice of animals for consumption as meat varies with socio-economic and religious background of the consumer (Abuska, 2006). Between 1980 and 1990 world production of meat increased by 29%; 15.6% in developed countries and 56% in developing countries, but the latter was from a very low base. The daily per capita availability of protein from meat increased by 24% but this increase was from 4.9 g to 6.1 g. In contrast these figures increased in developed countries by 8%, from 27.4 to 33.9 g per day (FAO Food Balance Sheets, 2014). Meat consumption in Cameroon was 13.3 kg/capita/year in 2010 but this consumption is low according to the world consumption of meat which is 41.9 kg/capita year (FAOSTAT, 2014a). That is why the government of Cameroon through the Ministry of Livestock, Fisheries and Animal Industries (MINEPIA) hosts many projects which aimed to improve meat consumption from 13.3 kg/capita/year to 23 kg/capita/year in 2020 (MINEPIA, 2020). However, the problem of the poor consumption rate of meat could not be the same all over the country, especially in the three northern regions (Adamawa, North and Far-North) where the highest potential of livestock production was found (MINEPIA, 2014).

A great deal of studies is available on meat production and consumption trends (Kaldjob et al, 2019; WFP, 2017; Akinwumi et al, 2011; Ahmed, 2007) but none of such exist in the Menoua. This paper therefore contributes in this same direction by assessing meat production and consumption trends on the Western Highlands of Cameroon, with evidence drawn from the Menoua Division. It hypothesized that there is a significant relationship between trends in meat production and consumption in Menoua Division.

2. Material and Method

This study was conducted in Menoua Division, located in the Western Region of Cameroon (figure 1). Of the eight subdivisions in Menoua, four were chosen purposively namely Dschang, Santchou, Penka-Michel, and Nkong-Ni because these are areas that have the presence of slaughterhouses and slaughter slabs where different animal species are slaughtered, purchased, and consumed.

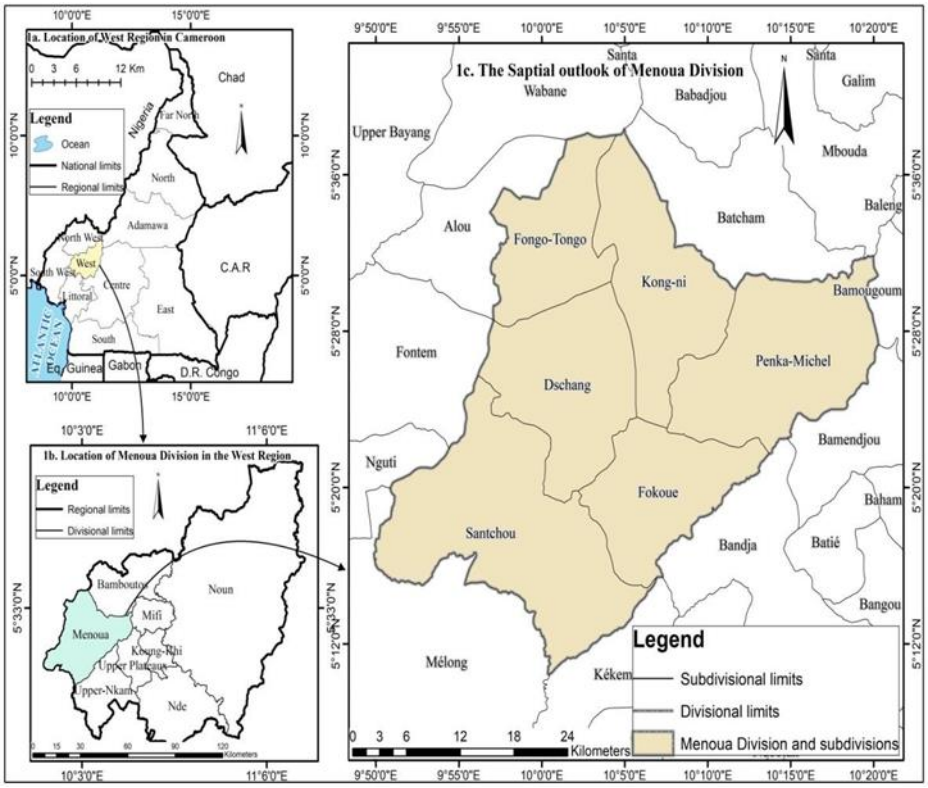

Figure 1. Location of Menoua Division in the West Region of Cameroon.

Source: Geo-database of Cameroon (NIC), 2020

A combination of purposive, simple random and cluster sampling techniques were used. Purposive sampling technique was used to select areas or elements from the population. Simple random and cluster sampling techniques was used in the selection of respondents and resource persons. The sample size was 302 households and 92 resource persons. Instrument of data collection was via the aid of structured and pre-tested questionnaires and interview guide. After data collection, Excel and Statistical Package for Social Sciences (SPSS) were used for data entry and analysed from the questionnaires. Data from interviews were subjected to thematic analysis. The hypothesis was tested with multiple correlation statistics at 0.5 alpha levels.

3. Results and Discussion

3.1. Quantity of Meat Produced and Evolution in the Menoua

Meat production within defined spaces (slaughterhouse or slap) in Menoua Division in 2020 shows a total of 14,032 cattle and 14,017 pigs slaughtered across the four slaughterhouses in the division. Statistics indicate that Dschang slaughterhouse registered 6,929 cattle representing 49.3%, closely followed by Santchou slaughter unit with 5,158 cattle slaughtered representing 36.8%, Penka- Michel 1,498 total cattle slaughtered representing 10.7%, Nkong-Ni recorded 450 slaughtered, rating 3.2%. The same trend followed for pigs slaughtered though with slight increase in number than that of cattle (table 1).

Table 1: Cattle and Pig slaughtered in the Menoua Division in 2020

SN	Location	Total Number Cattle slaughtered	%	Total number of pigs slaughtered	%
1	Dschang	6926	49.3	7642	54.6
2	Penka-Michel	1498	10.7	3039	21.7
3	Nkong-Ni	450	3.2	1409	10.0
4	Santchou	5158	36.8	1927	13.7
TOTAL		**14032**	**100**	**14017**	**100,0**

Source: Author's fieldwork, 2020

Of the total number of pigs (14,017) slaughtered in the Menoua in 2020, 54.6% were in Dschang abattoir, 21.7% in Penka-Michel, 10.0% in Nkong-Ni and 13.7% in Santchou.

There exists all over the study area irregular and clandestine slaughtering of livestock in unidentified spaces. This clandestine slaughtering is so rampant with livestock like pigs, goats, sheep, rabbits, almost all poultry and to a lesser extent, cattle. These are slaughtered in private backyards particularly during the Christmas season, end of year festivities and Muslim feasts. It was equally observed that most of the non- conventional slaughtering take place around villages of the Menoua during joyful or sad events like burials, funerals, Marriages, twin celebration, and enthronements. Organisers of such events most often prefer to buy whole animals like cattle, pigs, and goats, which are slaughtered in unconventional spaces in or around the ceremonial homes for cooking. This, they say, permits them to reduce cost of organization. Figure 2 illustrates conventional and nonconventional meat production spaces in the study area. It is clearly observed that unconventional spaces dominate the landscape, implying that more meat is produced in these clandestine spaces particularly during festive periods.

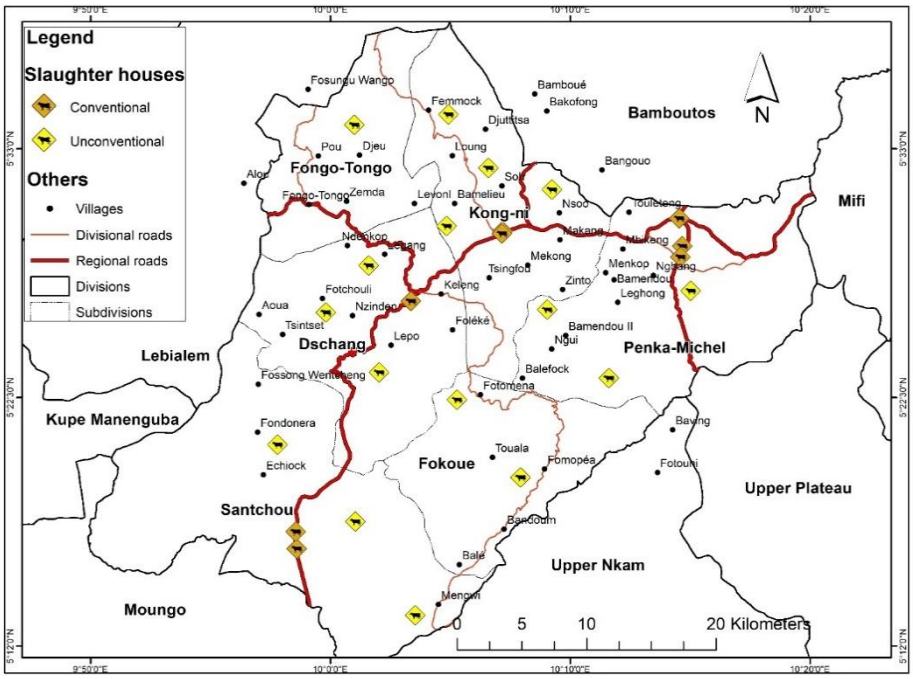

Figure 2. Conventional and unconventional slaughtering spaces in the Menoua
Source: Geo-database of Cameroon and field survey, 2020

Meat produced in the Menoua varies with time and space. There are periods of high demand and production and periods of low demand and production. The demand for meat is higher in towns like Dschang and Santchou, decreasing as one move to the periphery. This high meat demand in towns is explained by the concentration of populations of the middle- and working-class who as a result of their economic status, demand more meat. High supply Periods were November and December, corresponding to intensive cultural activities on the Highlands; and during periods of Christian and Muslim festivities. Table 2 shows the quantities of meat supplied to the population in the Menoua during periods of high and low demand and production.

Table 2. Daily quantity of meat produced in periods of high and low demand in Menoua

Type of meat	Period of high supply			Period of low supply			Quantity difference in Kgs
	Av no per day	Av KG/ animal	Total Kg	Av No / day	Av Kg/ animal	Total kg	
Chicken	4500	5	22500	1500	5	7500	15000
Beef	39	200	7800	16	200	3200	4600
Pork	100	35	3500	50	35	1750	1750
Mutton	40	30	1200	10	30	300	900
Goat meat	85	30	2500	40	30	1200	1350
Reared fish	10	5	50	4	5	20	30
Bush meat	5	7	35	2	7	14	21

Source: Divisional Delegation of livestock Menoua, 2020

Table 2 shows the average daily quantity of meat produced in the Menoua during periods of high and low demand. About 4500 chickens are slaughtered on a daily basis in the Menoua during periods of high demand. The average weight per chicken is 5kgs giving a total of 22500 Kg of chicken available for consumption daily during such periods. These periods of high demand correspond to the months of November, December, January, and February which are periods of intensive cultural celebrations in the Menoua as is the case in the whole of the Bamileke land. Chicken drops to 1500 in periods of low demand related to months of limited ceremonies (rainy season) in the Menoua. Equally it is observed that beef and pork also have a high and low demand period influenced by festive months, particularly during the end of year. Goat meat and mouton are considered exotic by the population and are only demanded by particular people. Such types of meat are in high demand during Muslim festive periods of the ram and the “Tabaski”. As for bush meat and reared fish, their periods of high and low demand depend on availability and are a function of social and economic factors.

3.2. Evolution in the number of controlled livestock (cattle) slaughtered in the Menoua

Statistics on the yearly number of livestock slaughtered in the study area for 2015, 2016, 2017, 2018 and 2019 for cattle and pig is indicated on table 3 and 4.

Table 3. Evolution of cattle slaughtered between 2015-2019

Location	**2015**	**2016**	**2017**	**2018**	**2019**	**Total**	**% change 2015-2019**
Dschang	1195	1206	1294	1539	1692	**6926**	49.4%
Penka-Michel	201	215	287	365	430	**1498**	10.6%
Nkong-Ni	51	56	96	126	121	**450**	3.2%
Santchou	748	757	1057	1233	1363	**5158**	36.7%
Total	**2195**	**2234**	**2734**	**3263**	**3606**	**14032**	**100.0%**

Source: Fieldwork data, 2020

In 2015, Dschang recorded the highest turnout of cattle slaughtered with a total number of 1,195; this was closely followed by Santchou with 740 cattle slaughtered that same year. While in Penka-Michel only 201 was slaughtered. The scale was very low for Nkong-Ni with just 51. In 2016, the same trend was maintained in all four zones with slight observed increases. By 2019, Dschang slaughter sphere had reached 1,692 cattle slaughtered; Santchou still maintained its second position with 1,363, while Penka-Michel and Nkong-Ni had evolved to 430 and 121 respectively.

The dominant position of Dschang in terms of number of cattle slaughtered is attributed to its population numbers. Dschang is the capital of the Menoua and is the seat of the lone state University of the West region which harbours an important staff and student population. Moreover, Dschang being the administrative, commercial and educational hub of the Menoua constitutes a great market for meat. Consequently, more meat is slaughtered and consumed in Dschang and its immediate surroundings. Judging in terms of output from 2015-2019; Dschang recorded the highest with 49.4% annual slaughter, seconded by Santchou 36.7%, Penka-Michel 10.6% and Nkong-Ni 3.2%.

Table 4 indicates evolution of pig slaughtered from 2015-2019. Statistics of the four study units revealed that in 2015, pig slaughter was highest in Dschang abattoir registering 1504 pigs, in 2016, total pig slaughtered in Dschang stood at 1,223, with a decrease of 281 pigs as compared to 2015. By 2017, total pigs slaughtered was 1583, the number increased to 1,640 by 2018 and 1,692 in 2019 given a sum total of 7,642 pigs slaughtered in four years.

For Penka-Michel, 690 pigs were slaughtered in 2015, 595 in 2016, and 601 pigs recorded in 2017, an increase of 21 pigs to give a cumulated annual total of 622 pigs slaughtered in 2018 and 631 in 2019. As witnessed from the statistic, Nkong-Ni, registered 196 pigs in 2015, the number in 2016 stood at 173, a decreased of 23 pigs as compared to 2015. The statistics in 2017 was 205 pigs, in 2018, it was 238 and in 2019, it reached 631, giving a cumulative total of the four years to be 3,039 slaughtered pigs.

Table 4. Evolution of pigs slaughtered form 2015-2019 in Menoua Division

Location	2915	2016	2017	2018	2019	Total	% change (2015-2019
Dschang	1504	1223	1583	1640	1692	**7642**	55.7%
Penka-Michel	590	595	601	622	631	**3039**	22.2
Nkong-Ni	196	173	205	238	297	**1109**	8.0%
Santchou	332	347	388	408	452	**1927**	14.1%
Total	**2622**	**2338**	**2777**	**2908**	**3072**	**13717**	**100.0%**

Source: Delegation of Livestock, Dschang, 2020

Santchou in 2015 registered 332 pigs, in 2016 the annual number was 347, in 2017, the figure stood at 388 pigs, by 2018 it reached 408 and by 2019, it was 452 registered slaughtered pigs. The percentage change between 2015 and 2019 within the four abattoirs in the Menoua, demonstrate that Dschang slaughter unit registered 55.7% within these years, Penka-Michel came second in the production of pork with 22.2%, followed by Santchou 14.1%. The least pork meat production unit in the area is Nkong-Ni recording 8.0% annual production rate from 2015- 2019. It is glaring from the analysis that there has been an increasing trend in the number of pigs slaughtered within formal meat production spaces under minimum control. It is clearly indicated that more pigs were slaughtered in Dschang between 2015 and 2019 (7,642) as compared to Penka-Michel (3,039), Santchou (1,927) and Nkong-Ni (1,109).

3.3. Sources of Meat Consumed in the Menoua Division

The meats consumed in the Menoua were observed to come from varied sources both within and without the study area (Table 5 and Figure 4).

Table 5: Sources of meat consumed in the Menoua division

Meat types	Sources of meat consumed in %		
	Menoua (%)	West Region (%)	Other regions (NW, AD, N, C and S regions) (%)
Birds	85.0	15.0	00.0
Cattle	10.0	20.0	70.0
Pigs	80.0	20.0	00.0
Sheep	15.0	35.0	50.0
Goats	30.0	35.0	35.0
Rabbit	70.0	20.0	10.0
Bush meat	10.0	10.0	80.0
Farmed fish	90.0	10.0	00.0

NW= Northwest; AD= Adamawa; N= North, C= Center; S= South

Source: Fieldwork data, 2020

Table 5 reveals that the Menoua ranks first in the provision of birds, evaluated at 85%, while other parts of the west region supply the remaining 15%. On the contrary, only 10% of the cattle slaughtered in the Menoua are from the Menoua, 20% of it is from the West region and 70% from other regions of Cameroon such as the Northwest, Adamawa, and the North. Pigs are at 80% from the study area and 20% from other parts of the West region. The table further shows that the bulk of sheep and goats slaughtered for consumption in the study matrix come from other regions of the country. Exotic meats derived from fish and animals like rabbits are 90% and 70% supplied by the Menoua since rabbits and fish are reared within the study area. Bush meat is at 80% from regions like the Centre, South, East and North.

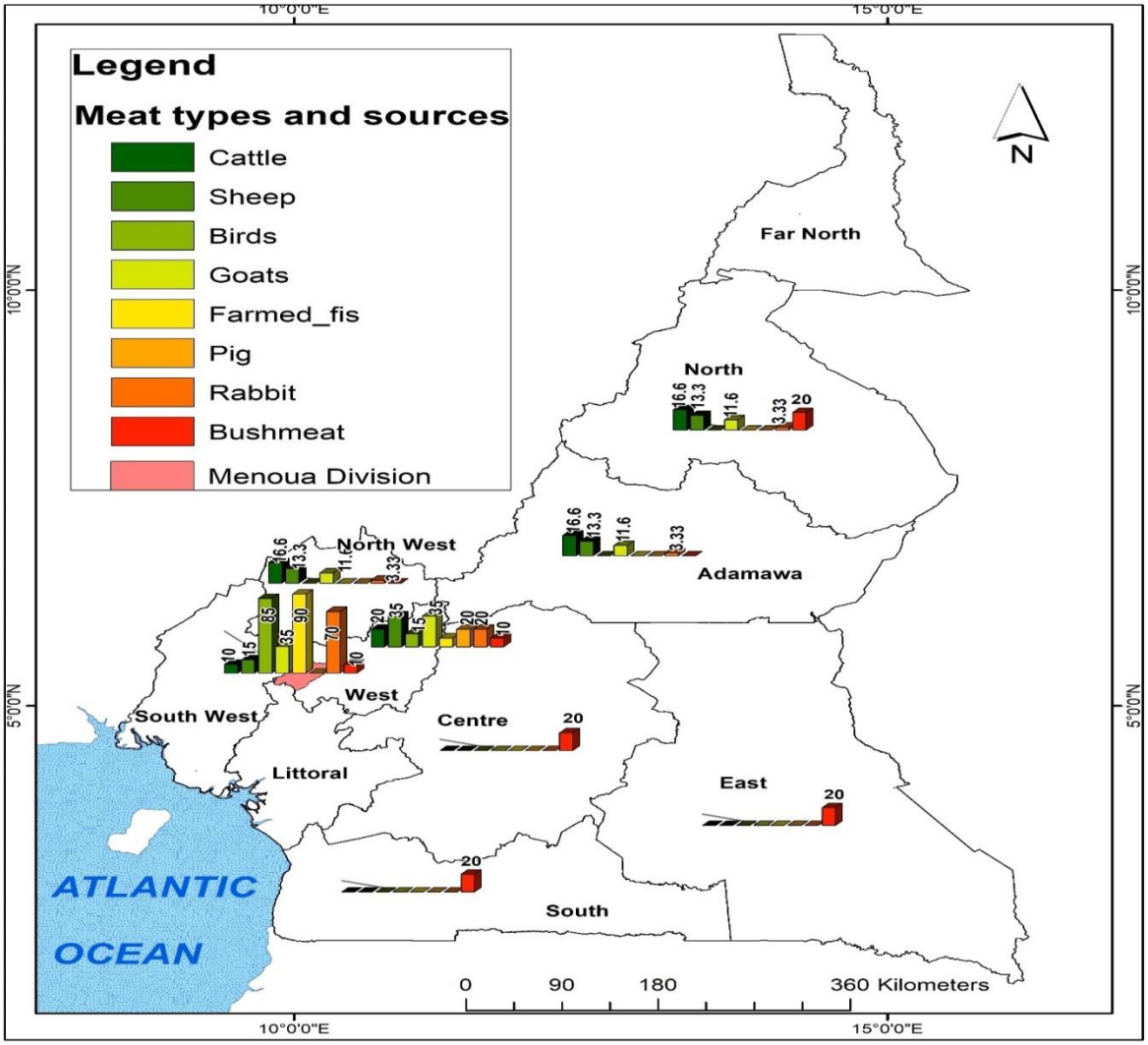

Figure 4: Origin of livestock slaughtered for meat in the Menoua

Source: Fieldwork, 2020

Figure 4 displays the various origins of livestock slaughtered for meat in the Menoua. According to the figure, cattle, table birds, goats, sheep, pigs, and bush meat are the major types of meat supplied for consumption in the study area. The flow of these animals vary as some are significant, and others less significant. The figure further reveals that livestock like

pigs, birds, goats, rabbits and farmed fish are dominantly provided by the Menoua, while cattle, sheep and bush meat come mostly from outside the West Region of Cameroon like the Adamawa, North, Centre, East and South.

3.4. Statistical relationship between trends in meat production and consumption

From the analysis as presented on table 6, there exists a perfect correlation between meat production and consumption trend at a calculated *P*-value of .000*. The correlation coefficient for meat production stands at 1.000, while consumption trends with the same calculated P-value =.000* with correlation coefficient 1.000.

Table 6. Correlations of the dependent and independents variables

Variables control			Meat Production	Consumption trend
N	Meat Production	Correlation	1.000	.850
		Sig. (1tailed)	.	.000*
155		df1	0	209
	Consumption Trend	Correlation	.850	1.000
		Sig. (1tailed)	.000*	.
		df2	209	0

Pearson moment correlation coefficient is significant at 0.000* alpha level

Source: fieldwork computation, 2022

Base on this result, it implies that there was a significant positive correlation between Meat production and consumption trends in the Menoua. On that note, we reject the null hypothesis (H_0) which states that Meat production has no significant relationship with consumption trends in Menoua Division and uphold the alternative (H_1) which state that Meat production has significant relationship with consumption trends in The Menoua Division

Findings have shown that meat is part of the diet and under high demand in the Menoua. The results have proven that high annual numbers of livestock slaughtered in the whole Division is in Dschang with 49.3% cattle and up to 54.6% pig slaughtered for consumption. The lowest rates were recorded at Nkong-Ni with just 3.5% of cattle slaughtered and 10.0% pig. This confirms to the findings of Abuska, (2006) who asserted that the choice of animals for consumption as meat varies with socio-economic background of the consumer. Similar results were arrived at in various countries in Africa as opined by Gamba, (2005) who noted that meat production and levels of consumption are controlled by socio-economic, demographic and cultural characteristics which are strongly influenced by the food preferences of consumers.

The production and consumption of Chicken and fish are close substitutes to cattle, pig, goats and sheep. This finding is in line with recent improvements in the marketing and distribution of chicken and fresh fish which have resulted in a reduction in the price of meat in the study matrix.

4. Conclusion

The study has demonstrated a strong positive correlation between meat production and consumption in the Menoua; noting that various meat types are produced and consumed within the four abattoir points of Dschang, Penka-Michel, Nkong-Ni and Santchou. Furthermore, the study displayed that cattle, pig, goat and sheep respectively constitute the highest slaughtered animals in Menoua. The demand for meat fluctuates as a result of chicken and fresh fish substitute which consumers also highly appreciate due to affordability. The paper strongly recommends sustainable solutions to environmental problems of meat production in Cameroon and the Menoua Division in particular through policies to ensure supplies of wholesome meat to consumers. This can only be achieved by enforcing existing laws strictly related to slaughterhouses. There should be a proper enforcement of the licensing system for slaughterhouses

References

Abuska, A. (2006). Assessment of pre-slaughter handling, slaughtering process and handling of meat to sale points. BSc. Dissertation, University for Development Studies, Tamale. Pp. 1-38.

Adams, C. F. (1995). Nutritive value of American food in common units. *USDA Hand book* No. Y56, Washington D. C.

Adzitey, F. (2013). Animal and meat production in Ghana- An Overview. *The Journal of World's Poultry Research, 3,* 01-04.

Ahmed, G., & R. Krishea. (2007). Inter-Household and Consumption of Fish and MeatConsumption in Fishing Communities in Imo State of Nigeria. *British Journal of Nutrition, 97,* 145- 152.

Akinwumi, A. O., Odunsi, A., Omojola, A., Aworemi, J. R. & Aderinola, O. (2011). Consumer perception and preference for meat types in Ogbomoso area of Oyo State, Nigeria. *International Journal of Applied Agricultural and Apicultural Research, 7*(1), 96-106.

Annuaire Statistique du Cameroun. (2015.). Annuaire Statistique du Cameroun 2015. Accessed August 20, 2022. http://www.statistics-cameroon.org/news.php?id=345.

FAO. (2014). Food and Agriculture Organization of the United Nations. Study of slaughterhouse in Central Africa (Cameroon-Congo- GabonChad). Summary. 70p. Available at: http://faostat.fao.org/site/610/DesktopDefault.aspx?PageID=610#an

FAOSTAT. (2014a). Food and Agriculture Organization of the United Nations. Available at: http://faostat.fao.org/site/610/default.aspx#ancor.

Food and Agricultural Organization (FAO). (2019). Global Perspective Agriculture: Towards 2015/30. Technical Interview Report: Economics and Social Department. Food and Agricultural Organization of the United Nations. Rome, Italy.

Gamba, P. (2005). Urban Domestic Consumption Patterns for Meat: Trends and Policy

Implications. Tegemeo Institute of Agricultural Policy and Development, Egerton University. Working Paper 17. pp. 1-24.

Kaldjob M. Christian, Enangue N. Annick, Siri Bella N., & Etchu Kingsley (2019). Socio-economic perception of snail meat consumption in Fako division, south-west region Cameroon. *International Journal of Livestock Production*,*10*(5), 143-150. https://doi.org/10.5897/IJLP2018.0543

MINEPIA (Ministère de l'Elevage, des Pêches et des Industries Animales). (2014). Document de stratégie du sous-secteur de l'élevage, des pêches et des industries animales, p121.

MINEPIA. (2020). Ministère de l'Elevage, des Pêches et des Industries Animales. MINEPIA

Policy Document. 29p.

Regmi, A. (2002). Urbanization and Food Consumption. A USDA City Study. USDA Washington.

Sulley, M. S. (2006). The hygienic standard of meat handling in the Tamale Metropolis. BSc. Dissertation, University for Development Studies, Tamale. Pp. 1-39.

World food Programme. (2017). (WPF), and Ministry of Agriculture and Rural Development (MINADER) (2017). Comprehensive Food Security and Vulnerability Analysis (CFSVA).