



Statistical analysis of raw hides and skins production and losses in Sabon Gari and Zaria local government areas in Kaduna state

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ABSTRACT

This paper is a study of the extent of hides and skins production and recovery rates in Zaria municipal, to show the estimated profile of its economic impact in the local government areas and state in general. Based on the analysis of the annual livestock off-take, and recovery rate figures collected from the two local government areas, it has been shown that out of 140,895 pieces, only a total of 54,180 pieces of hides and skins were recovered, indicating a 61.5% loss as only 86,715 pieces of hides and skins could be recovered. Further diagnostic analysis of the causative reasons for the loss showed that 88.2% was caused by human consumption of hides ('ponmo') and skins as 'bokoto'. Human consumption of hides and skins at this rate if left unabated threatens the future survival of the Nigerian leather and leather products industries.

Keywords — Hides and skins, Off-take and recovery rates, Human consumption, Nigerian tanning industries

1. INTRODUCTION

On a world scale, a significant amount of sheep and lamb skins originate predominantly in China, New Zealand, Australia, the Near East and the EU. Globally, approximately 6.0 million tonnes of raw hides on a wet salted basis were processed to yield about 522600 tonnes of heavy leather and about 12759 million square feet of light leather, including split leather. In comparison, Europe produced about 71700 tonnes of heavy leather and about 2473 million square feet of light leather. For goat and sheep worldwide 646800 tonnes of raw skins on a dry basis were converted into almost 4716 million square feet of sheep and goat leather (Behailu, 2017). The raw materials for leather and leather products industry are hides and skins mainly from livestock and Nigeria is endowed with the third largest livestock population in Africa. 'Northern Nigeria has been renowned for centuries for its exquisite leather and artisan craftwork of Hausa –Fulani people. The red Sokoto goats yield soft leather which has no superior anywhere and for which there has long existed a worldwide demand. Even in medieval times, it was exported to North Africa and from then under the name of Morocco leather, much of it went to Europe. The main centres of hides and skins production in Nigeria are the northern states of Kano, Sokoto, Katsina, Jigawa, Borno, Kaduna (Sabon Gari and Zaria local government areas), Adamawa, Yobe and Bauchi. The net comparative advantage enjoyed by these states in livestock production confers on them the corresponding advantage of enormous hides and skin production. The ecology of the northern states of Nigeria is very conducive for large scale animal husbandry (Umar *et al.*, 2015). It has been realized that the human consumption of raw hides and skins as ponmo is an economic agony that stands against profit. Because of this, the federal government in 2014 has considered banning the sale and widespread consumption of the delicacy. This banning would take the form of 'complete regulations' that would check the consumption and sales of hides and skins in Nigeria. The idea is to enrich farmers so that they will earn money from the products (Akinwunmi, 2014). Agricultural growth, particularly through improved productivity and market access, is one of the principal routes to reducing poverty in developing countries. There is considerable diversity across countries with regard to the importance of smallholder livestock keeping in rural livelihoods (Juhar *et al.*, 2015). It is therefore reasonable for stakeholders such as the Nigerian Institute of Animal Science to advocates and publicly enlightens the media to promote livestock value addition as against the sale and consumption of the primary products, which ought to be tanned into leather for very high foreign currency earning returns to the farmer and tanners.

The Agricultural Transformation Agenda (ATA) is a federal government policy pronouncement that intends to drive the agricultural value chains with increased vigour in all its ramifications through its continuous support and cooperation towards the stakeholders in the livestock sector to deliver the benefits they needed.

It is envisaged that satisfactory product levels would be achieved to reach animal byproducts such as hides and skins and leather. This is against the backdrop that foreign exchange earnings from leather export resonate between first and second among the non-

oil export. But this notwithstanding, there are only seven out of forty-one existing tanneries in Nigeria that are currently operating due to a shortage of the raw material input hides and skins. The availability of raw hides and skins can grow the Nigerian economy and create more employment.

Considerations for the recovery rates and the causative actions using a novel model of estimation would prove invaluable and an effective approach to assessing why poor recovery and utilization are endemic in the livestock industry. In this study, it is considered that an understanding of the estimates of recoveries and losses is a positive index to boosting the livestock value chains. This paper, therefore, reports the statistical analysis of raw hides and skins production and losses in Sabon gari and Zaria local government areas in kaduna state.

2. METHODOLOGY

2.1 Data collection

An annual data of daily livestock slaughtering between January and December was carried in 2014 in all the ten existing slaughtering places in the two local government areas, namely Sabon Gari and Zaria city in Zaria municipality.

2.2 Data analysis/Calculated estimates

To profile the activities at each of the slaughterhouses, a preliminary trend study was carried out and scored to determine the recovery and loss rates which formed the basis for the factorials in Appendix I. The actual slaughter figures from each slaughterhouse were extrapolated using the calculated rates in Appendix I. Each category of livestock from the slaughter slabs was weighted and scored against the three categories above.

2.3 Diagnostic off-take and recovery rates

To further estimate the impact of the type of livestock i.e., cattle, goat and sheep skins recoveries, three parameters of interest in the study were estimated using the variable rates in Appendix II for:

- (a) Production and flaying
- (b) Preservation and storage, and
- (c) Utilization (Human consumption of raw hides and skins).

A diagnostic study of hides and skins production, preservation and utilization in Zaria municipal is an estimation of the recovery rates of raw hides and skins after slaughter and the diminishing effects of the causative effects of production, preservation, and utilization on actual slaughter figures. The recovery rates of hides and skins production and flaying, preservation and storage, and human consumption in Sabon Gari and Zaria Local government areas were therefore estimated based on the following considerations:

- (a) Total numbers of slaughtered cattle, goats and sheep.
- (b) Recoveries were categorized according to production and flaying, preservation and storage, and human consumption.

Graphical plots

The clustered column bar chart was used for the distributions of the recovery profiles.

Percentage estimation of profiles

The estimated figures for slaughter and off-takes of cattle, goat and sheep; and the diagnostic figures for production, preservation and human consumption of hides and skins were expressed as a percentage of summed total where appropriate.

3. RESULTS AND DISCUSSIONS

Table 1: Livestock off-take figures in Sabon Gari and Zaria Local Government Areas, Kaduna State (January – December 2014)

S/N	Abattoir/Slaughter slabs	Cattle	Goats	Sheep
1.	Zango abattoir	12,704	119	-
2.	Dogarawa †	-	55,530	12,244
3.	Tudun Wada †	7,642	12,034	2,626
4.	Zaria city †	3,864	12,034	2,626
5.	Dandaurawa †	3,662	17	22
6.	Angwan Jaba †	6	7,162	138
7.	Dan Magaji †	22	4,059	776
8.	Samaru †	14	1,357	237
9.	Basawa †	8	860	213
10.	Bomo †	6	772	141
Total $\Sigma = 142,625$		27,928	94,412	20,285

Table 2: Hides and skins recovery at slaughter houses in Sabon Gari and Zaria City LGAs in Kaduna State

S/N	Abattoir/Slaughter slabs	Cattle	Goats	Sheep
1.	Zango abattoir	5,793	-	-
2.	Dogarawa †	-	32,763	7,395
3.	Tudun Wada †	2,094	1,650	746
4.	Zaria city †	533	1,540	341
5.	Dandaurawa †	480	-	-
6.	Angwan Jaba †	-	573	-

7.	Dan Magaji †	-	175	-
8.	Samaru †	-	20	3
9.	Basawa †	-	8	2
10.	Bomo †	-	63	1
Total $\Sigma = 54,180$		8,900	36,792	8,488

Table 3: Hides and skins losses at slaughter houses in Sabon Gari and Zaria City LGAs in Kaduna State

S/N	Abattoir/Slaughter slabs	Cattle	Goats	Sheep
1.	Zango abattoir	7,877	74	14
2.	Dogarawa †	-	34,429	7,591
3.	Tudun Wada †	4,738	7,751	2,410
4.	Zaria city †	2,396	7,461	1,628
5.	Dandaurawa †	2,270	11	14
6.	Angwan Jaba †	4	4,440	86
7.	Dan Magaji †	14	2,517	481
8.	Samaru †	9	841	147
9.	Basawa †	5	533	132
10.	Bomo †	4	479	87
Total $\Sigma = 88,431$		17,317	58,536	12,592

Table 4: Cattle Hides Off-take Figures at Sabon Gari and Zaria City LGAs in Kaduna State.

S/N	Abattoir/Slaughter slabs	Preservation/ storage	Production/ Flaying	Human consumption
1.	Zango abattoir	-	5,679	7,025
2.	Dogarawa †	-	12,489	15,440
3.	Tudun Wada †	-	3,416	4,226
4.	Zaria city †	-	1,727	2,137
5.	Dandaurawa †	-	1,640	2,022
6.	Angwan Jaba †	-	3	3
7.	Dan Magaji †	-	10	12
8.	Samaru †	-	6	8
9.	Basawa †	-	3	5
10.	Bomo †	-	3	3
Total $\Sigma = 55,857$		-	24,076	30,881

Table 5: Goat Skins Off-take Figures at Sabon Gari and Zaria City LGAs in Kaduna State

S/N	Abattoir/Slaughter slabs	Preservation/ storage	Production/ Flaying	Human consumption
1.	Zango abattoir	2	2	115
2.	Dogarawa †	1,055	1,055	53,420
3.	Tudun Wada †	237.5	237.5	12,027
4.	Zaria city †	229	229	11,577
5.	Dandaurawa †	0.5	0.5	16
6.	Angwan Jaba †	136	136	6,890
7.	Dan Magaji †	77	77	3,905
8.	Samaru †	26	26	827
9.	Basawa †	16	16	1,305
10.	Bomo †	15	15	743
Total $\Sigma = 94,413$		1,794	1,794	90,825

Table 6: Sheep Skins Off-take Figures at Sabon Gari and Zaria City LGAs in Kaduna State

S/N	Abattoir/Slaughter slabs	Preservation/ storage	Production/ Flaying	Human consumption
1.	Zango abattoir	-	-	-
2.	Dogarawa †	722	722	10,799
3.	Tudun Wada †	229	228	3,429
4.	Zaria city †	155	155	2,316
5.	Dandaurawa †	1	1	20
6.	Angwan Jaba †	8	8	130
7.	Dan Magaji †	46	46	684
8.	Samaru †	14	14	209
9.	Basawa †	13	13	188
10.	Bomo †	8	8	124
Total $\Sigma = 20,446$		1,196	1,196	17,899

Nb: † = Slaughter slab

Table 7: Annual percentage cause of losses

S/N	Parameter	Production	Preservation	Human consumption
1.	Cattle	43.1	0.6	55.3
2.	Goat	1.9	1.9	96.2
3.	Sheep	5.8	5.8	89.4

4. DISCUSSION

4.1 Off take figures

Results of Table 1 shows that a total of 142,625 livestock were slaughtered at the various slaughterhouses in Sabon Gari and Zaria local government areas, comprising of 27,928 cattle, 94,412 goats and 20,288 sheep in 2014. Further break down of the figures showed that the recovery rates for each category of livestock were in the following order:

- (a) Cattle hides production are dominant at Zango abattoir (12,704 pieces), > Tudun Wada (7, 642 pieces), > Zaria City (3,864 pieces), > Dandaurawa (3,662 pieces).
- (b) Goatskins production were dominant at Dogorawa (55,530 pieces), > Tudun Wada (12,502 pieces), >Zaria city (12,034 pieces), > Angwan Jaba (7,162 pieces), > Dan Magaji (4,059 pieces).
- (c) Sheepskin production was dominant at Dogorawa (12,244 pieces), >Tudun Wada (3,888 pieces), > Zaria city (2,626 pieces).

Table 2 shows a total of 46,200 pieces of hides and skins that were recovered and comprised of 890 pieces of cattle hides, 36,792 pieces of goat skins, and 8,518 pieces of sheepskins. Table 3 shows that 88,304 pieces of hides and skins were lost in 2014 at the various slaughterhouses in Sabon Gari and Zaria local government areas comprising of 19,032 pieces of cattle hides, 57,505 pieces of goat skins, and 11,767 pieces of sheepskins. Table 4 shows that a total of 55,857 pieces of cattle hides were recovered from Sabon Gari and Zaria slaughterhouses comprising of 24,076 hides resulting from production and flaying, and 30,881 due to human consumption.

4.2 Diagnostic recovery

Figure 1 shows the diagnostic distribution. Table 5 shows that a total of 94,413 goatskins off-take from Sabon Gari and Zaria slaughterhouses comprising of 1,794 pieces with preservation and storage defects, 1,794 pieces with production and flaying defects and 90,825 pieces that were unaccounted for due to human consumption, skin defects during ante slaughter and post-slaughter (Abraham et al., 2017). Table 6 shows that a total of 20,446 Sheep skins off-take comprising of 1,196 pieces with preservation and storage defects, 1,196 production and flaying defects, and 17,899 pieces that were unaccounted for due to human consumption. Table 7 shows the figures of annual percentage cause of losses for cattle, 43.1% of the losses were due to production and flaying, 55.3% losses caused by outright human consumption, which adds up 98.4%. This high rate of consumption and preference for ponmo has a negative implication for the supply of hides and skins to leather and leather products industries in Nigeria (Joseph, 2006).

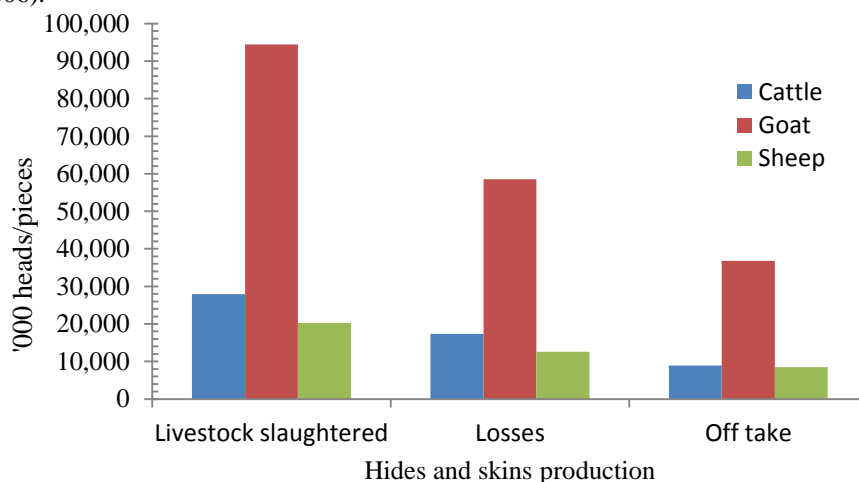


Fig. 1: Distribution plot of hides and skins production at Sabon Gari and Zaria local government areas

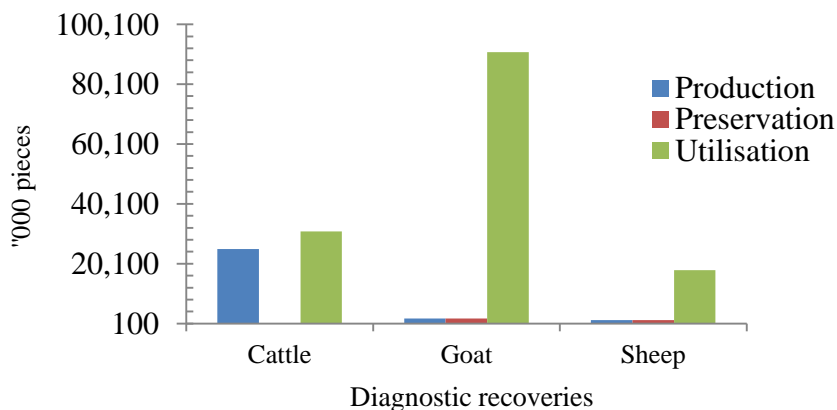


Fig. 2: Diagnostic plot of hides and skins losses in Sabon Gari and Zauzau local government areas

5. CONCLUSION

Sabon Gari and Zaria animal slaughtering houses have appreciable quantities of hides and skins off-take rates in some designated places. Out of the total sum of 140,895 pieces of hides and skins made up of 27,928 cattle hides, 93,944 goat skins and 19, 023 pieces of sheepskins, only a total of 54,180 pieces of hides and skins were recovered made up of 8,900 cattle hides 36,792 goat skins and 8,488 pieces of sheepskins. Hence a deficit of 86,715 pieces of hides and skins were lost, representing 61.5% of slaughtered animals. Among the three possible factors that could cause the loss was human consumption which represented 88.2%. The economic loss consequent on this should attract stringent measures by the local, state and federal governments to encourage hides and skins recovery rate for the domestic utilization of the Nigerian tanning industry.

Appendix I: Recovery Rate (%) of Hides and Skins at each Slaughter House

S/N	Abattoir/Slaughter slabs	Cattle	Goats	Sheep
1.	Zango abattoir	45.5	0.13	0
2.	Dogarawa †	0	158.82	60.36
3.	Tudun Wada †	27.40	13.24	19.17
4.	Zaria city †	13.80	12.75	12.95
5.	Dandaurawa †	13.10	0.02	0.11
6.	Angwan Jaba †	0.02	7.59	0.67
7.	Dan Magaji †	0.08	4.30	3.83
8.	Samaru †	0.05	1.44	1.16
9.	Basawa †	0.03	0.91	1.05
10.	Bomo †	0.03	0.82	0.70
Total		100	100	100

Nb: † = Slaughter slab.

Appendix II: Diagnostic rates of the production, preservation and utilization parameters

S/N	Parameters (%)	Cattle	Goats	Sheep
1.	Production/Flaying	-	1.9	5.9
2.	Preservation/ storage	44.7	1.9	5.9
3.	Human consumption	55.3	96.2	88.2
Total		100	100	100

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