World Journal of Advanced Research and Reviews
eISSN: 2581-9615 CODEN (USA): WJARAI
Cross Ref DOI: 10.30574/wjarr
Journal homepage: https://wjarr.com/

(RESEARCH ARTICLE)

Check for updates

Non zootechnical factors influencing the wholesale trade of ruminants by wholesale traders in the urban community of Niamey

M. Bahari Amadou Abdoulaye [1,*], Issa Hamadou [2], Abdoul Aziz Maman Lawal [2], Ali Bako Ousmane [3] and Hamza Seydou Korombé [4]

[1] *Department of Rural Economics, National Institute of Agronomic Research of Niger. Sociology, and Technology Transfer. P.O. Box: 429. Niamey-Niger.*
[2] *National Institute of Agronomic Research of Niger. Department of Animal Production. P.O. Box: 429. Niamey-Niger.*
[3] *Bako Ousmane Ali Researcher associated with the Laboratory of Studies and Research on Economic Emergence (LAEREE) at Abdou Moumouni University (UAM) in the Faculty of Economic Sciences and Management (FSEG).*
[4] *Ministry of Agriculture and Livestock, Cattle Multiplication Center, Animal Science Service. P.O. Box: 827. Niamey-Niger.*

World Journal of Advanced Research and Reviews, 2025, 27(03), 1707-1717

Publication history: Received on 19 August 2025; revised on 25 September 2025; accepted on 27 September 2025

Article DOI: https://doi.org/10.30574/wjarr.2025.27.3.3343

Abstract

This study was conducted at the main livestock markets of the urban community of Niamey. It identified the non-zoo-technical parameters influencing the sale of cattle by wholesale traders. In the context of the study, sixteen (16) non-zoo-technical parameters were analyzed through multiple linear regression to determine their significance levels. The analysis resulted in seven (7) significant variables.

The results obtained revealed the importance of non zoothechnical variables in the process of selling cattle by wholesale traders. Thus, marital status (widowed) and education level (secondary and traditionally illiterate) showed a significant influence of 10% on sales. Cash payment and barter, the Koira Tegui market, and delivery after sale had a significant influence of 5% on sales. The variables of affiliation to an organization, the reason for purchase for breeding, and the location of the Tourakou market revealed a significant influence at 1%.

The conditions of significant variables are summarized by membership in an organization, livestock farming, widow status, the markets of Koira Tegui and Tourakou, levels of traditional literacy and secondary education, and payment in cash and by barter.

Keywords: Sale; Cattle; Wholesale Merchants; Non Zootecnic Determinants; Urban Community Of Niamey.

1. Introduction

Livestock farming represents a major asset in West Africa. The sector contributes 10-15% to the agricultural GDP [4]. The contribution of livestock is estimated through animal products and the resources generated. The sale of live cattle is the main provider of resources for communities in pastoral areas [5]. Niger, classified as a livestock country, has an important population of 24.041.678 UBT [19]. Livestock provides 11% of the national GDP and 35% of the agricultural GDP [20]. The livestock sector represents 3.911 billion Fcfa [19]. The sale of live cattle generates enormous financial resources [4].

The Niamey region is home to a stock of 143.779 UBT across all species, with 73.777 UBT for cattle [19]. The sale of livestock is an important activity for breeders and decentralized entities. Breeders regularly resort to the sale of live

* Corresponding author: M. Bahari Amadou Abdoulaye

cattle to meet their needs. Cattle represent the second species to be sold after small ruminants [5]. The importance of livestock in the national economy has led to several studies on the cattle-meat sector. At the regional level, these studies mainly focus on: the explanatory factors of the selling price of Tabaski sheep in Dakar [16], price variations in the small ruminant market in Bouaké [24], the evaluation of livestock-meat value chains in West Africa [25], and the study of the marketing of live cattle in Senegal [22].

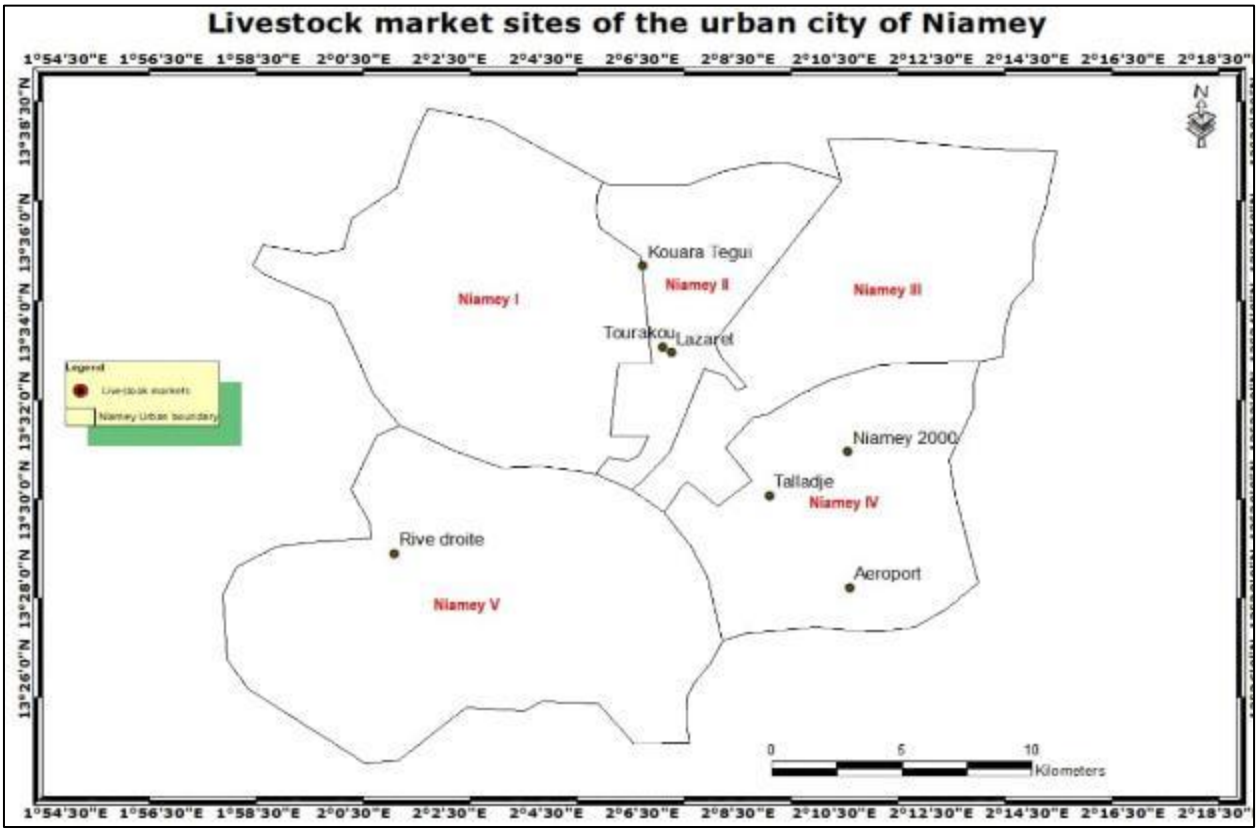
The studies conducted at the national level have primarily focused on the role of commercial cattle exploitation in the economy of pastoral households in Niger [5], the impact of exports to Nigeria on the sheep sector in Niger [21], the analysis of the sale by weight of cattle in Gothèye [23], and the marketing of sheep in the Maradi region [1].

These studies mostly focus on sale prices and the zootechnical parameters of the animals. Indeed, very few studies have addressed non zootecnical parameters; this is the case for the work on "Factors associated with selling price of cattle at livestock marts" conducted by [15], which considered the level of education; the study of "Beef cattle value chain analysis" which took into account the selling period in the analysis of animal product sales [3].

In light of the insufficiency of studies regarding non zootecnical parameters in the process of selling live cattle, it is important to focus on works that take these into account. This will provide data serving as a decision-making tool. The present study thus aims to determine the non zootecnical parameters influencing the sale of cattle by wholesale traders in the urban community of Niamey.

2. Materials and method

The study was conducted at the level of the five districts of the urban community of Niamey (CUN). It focused on the main livestock markets of the CUN: the markets of the Airport, Koira Tegui, Lazaret, Niamey 2000, Talladjé, Tourakou, and the Right Bank (Figure 1.).



Source: Bahari and Moumouni

Figure 1 Map of the study area

This study is intended for wholesale traders and aims to identify the non zoothechnical factors determining the sale of cattle.

The choice of the sample to be surveyed was estimated using [10 formula:

Sample size (n) = $[z^2 * p(1-p)] / e^2$

- z = z-score;
- e = margin of error;
- p = standard deviation;

z = 1.96: Desired confidence level. It corresponds to a 95% confidence level;

p = 0.5: Level of indicators to be measured;

e = 0.05: Acceptable margin of error.

n = $(1.96)^2 * 0.5 (1-0.5) / (0.05)^2 = 385$

n = 385.

The sample size has been expanded to three hundred eighty-nine surveyed individuals, or **n = 389**.

Data were collected using survey forms. For the needs of the study, five interviewers were recruited. The survey forms are structured around sixteen (16) variables:

- The payment method;
- The nature of the price;
- The location of the market;
- The age category;
- Marital status;
- Gender;
- The respondent's ethnicity;
- Education level;
- The reason for purchase;
- The nature of the sale;
- The type of supplier;
- Affiliation to an organization;
- Delivery after sale;
- The nature of the sales premises;
- The species being marketed;
- The nature of the market.

The variables are subdivided into several modalities (2 to 7). The analyses were performed using Stata software. The analyses allowed us, through the application of multiple linear regression, to determine the influence of the studied variables on cattle sales.

The results obtained were used for writing an econometric model.

For the formulation of the model, [13] was used:

$$Y = \beta 0 + \beta 1X1 + \beta 2X2 + \cdots + \beta kXk + \varepsilon.$$

Taking into account the variables retained in the context of the study, the model is written as:

SALES = β0 + β1Payment_Mode + β2Age_Category + β3Education_Level + β4Purchase_Reason + β5Gender + β6Ethnicity + β7Marital_Status + β8Market_Location + β9Organization_Affiliation + β10Delivery + β11Supplier_Nature + β12Price_Nature + β13Sales_Nature + β14Marketed_Species + β15Local_Nature + β16Market_Nature + ε.

The different quantities involved in the final writing of the model are:

- SALES: the explained or dependent variable

- Payment_Mode, Age_Category, Education_Level, Purchase_Reason, Gender, Ethnicity, Marital_Status, Market_Location, Market_Nature, Organization_Affiliation, Delivery, Supplier_Nature, Sales_Nature, Price_Appreciation, Marketed_Species, Local_Nature: explanatory or independent variables

- β0, ..., β16: the parameters to be estimated

- ε is the error term.

When considering only the significant variables (ethnicity, affiliation to an organization, reason for purchase, marital status, market location, and payment method), the simplified model is expressed as:

SALES = β0 + β1Education_Level + β2Reason_Purchase + β3Marital_Status + β4Organization_Affiliation + β5Market_Location + β6Payment_Method + β7Delivery_Sale+$\boldsymbol{\varepsilon}$

In conclusion, the values retained for the model are:

- SALES: the explained or dependent variable

- Purchase_Reason, Education_Level, Marital_Status, Organization_Affiliation, Market_Location, Sales_Delivery, and Payment_Method: explanatory or independent variables

- β0 · · · , β7: the parameters to be estimated

- ε is the error term.

The analysis of the coefficients of the explanatory variables is done in relation to the so-called reference modality.

At the level of each variable, the reference modality corresponds to the modality that does not appear in the table of coefficients of the explanatory variables.

The analysis involves performing a regression of the so-called qualitative variables on a quantitative variable (sales). To do this, the study had to resort to a linear model with categorization. Thus, linear regression based on the least squares method (LSM) was used.

3. Results

Table 1 gives the statistical description of the explanatory variables, the related modalities and their level of significance.

Table 1 Descriptive statistics

Variables	Modalities	%	Level of Significance
Payment method	Cash	82.01	p<0.05
	Credit	15.17	
	Barter	2.83	
Nature Market	Collection	42.42	Not significant
	Grouping	21.08	
	Terminal	36.50	
Reason for purchase	Slaughter	52.70	p<0.01
	Breeding	1.54	
	Sacrifice	26.48	

	Resale	19.28	
Price assessment	Acceptable	90.75	Not significant
	High	6.17	
	Very High	3.08	
Level of education	Arabic literacy	11.05	p<0.1
	Illiterate Traditional literate	26.48 19.79	
	Primary school	33.93	
	Secondary	8.74	
Market Location	Aéroport	11.05	
	Koira Tegui	6.17	p<0.05
	Lazaret	3.08	
	Niamey 2000	5.40	
	Rive droite	10.80	
	Talladjé	6.43	p<0.01
	Tourakou	57.07	
Marital status	Single	16.71	
	Married Divorced Widower	75.32 3.86 4.11	p<0.1
Commercial_Species	Cattle	100	Not significant
Gender	Male	100	Not significant
Ethnicity	Djerma	37.28	Not significant
	Haoussa	44.22	
	Peul	13.62	
	Touareg	4.88	
Organization Affiliation	No	11.57	p<0.01
	Yes	88.43	
Suppliers	Bucher	10.03	Not significant
	Retailer Breeder	20.31 53.73	
	Other Wolesaler	15.94	
Nature of sale	Big	13.27	Not significant
	Detail Contractual	72.49 16.45	
Delivery	No	54.24	0.05
	Yes	45.76	

Age category	Adolescent	10.54	Not significant
	Adult	75.58	
	Elderly	13.88	
Local_Nature	Straw barn Metal shed Without hangar	19.02 1.29 79.69	Not significant

Note: The P-value was used to determine the level of significance.

The analysis of Table 1 shows:

- The variables affiliation to an organization, purchase motive (breeding), and market location (Tourakou) are significant at 1%;
- The variables payment method (cash, barter), post-sale delivery (yes), and market location (Koira Tegui) are significant at the 5% level.
- The variables marital status (widower) and education level (traditionally literate and secondary) are significant at 10%.

Table 2 presents the results related to the analysis of variance, the overall significance test, and the goodness of fit.

Table 2 Analysis of variance table, global significance test and goodness of fit.

Residual	**SS**	**df**	**MS**	**Number of observations**	**=**	**389**
		F (35.353)	=	2.96		
Model	1379.0513	35	39.401466	Prob > F	=	0.000
Residual	4703.9204	353	13.325554	R-squared	=	0.2267
		Adj R-squared	=	0.15		
Total	6082.9717	388	15.677762	Root MSE	=	3.6504

The model is globally significant at 1%.

The goodness of fit is average (Root MSE=3.6504).

Table 3 describes the coefficients of the explanatory variables used.

Table 3 Estimated coefficients of the explanatory variables.

Sales	**Coefficient**	**Std. err.**	**t**	**P>t**	**95% confidence**	**Interval**
Age category	-0.336611	0.3995949	-0.84	0.4	-1.1225	0.449275
Marital status						
Divorced	0.2777059	1.095958	0.25	0.8	-1.87772	2.433134
Married	-0.570032	0.5346983	-1.07	0.287	-1.62163	0.481562
Widower	-2.085499	1.06761	-1.95	0.052	-4.18518	0.014177
Ethnicity						
Haoussa	0.5924665	0.5277061	1.12	0.262	-0.44538	1.63031
Peulh	-0.019227	0.7072504	-0.03	0.978	-1.41018	1.371728
Touareg	-0.996847	1.092705	-0.91	0.362	-3.14588	1.152185
Level of education						

Traditional literate	-1.566145	0.9447892	-1.66	0.098	-3.42427	0.291978
Illiterate	-0.911084	0.8781402	-1.04	0.3	-2.63813	0.815961
Primary school	-1.138836	0.752679	-1.51	0.131	-2.61914	0.341463
Secondary	-1.738232	1.051736	-1.65	0.099	-3.80669	0.330225
Organization Affiliation						
Yes	3.44102	0.7076525	4.86	0	2.049275	4.832765
Payment method						
Cash	1.383473	0.5476191	2.53	0.012	0.306467	2.460479
Barter	2.588453	1.268582	2.04	0.042	0.093524	5.083382
Market Location						
Koira Tegui	2.209892	1.066491	2.07	0.039	0.112416	4.307369
Lazaret	1.678626	1.345325	1.25	0.213	-0.96723	4.324487
Niamey 2000	1.189172	1.103275	1.08	0.282	-0.98065	3.358991
Rive droite	1.021887	0.9298203	1.1	0.273	-0.8068	2.850571
Talladjé	1.591837	1.039273	1.53	0.126	-0.45211	3.635781
Tourakou	2.296189	0.7370695	3.12	0.002	0.846589	3.745788
Commercial_Species						
Cattle	0 (omitted)					
Gender						
Male	0 (omitted)					
Reason for purchase						
Breeding	5.45456	1.685761	3.24	0.001	2.139162	8.769958
Resale	0.7966157	0.6189393	1.29	0.199	-0.42066	2.013888
Sacrifice	-0.270739	0.6501442	-0.42	0.677	-1.54938	1.007904
Nature of sale						
Detail	0.4254342	0.7653105	0.56	0.579	-1.07971	1.930576
Big	1.096716	0.873719	1.26	0.21	-0.62163	2.815066
Price assessment						
High	-1.268005	0.8350233	-1.52	0.13	-2.91025	0.374241
Very High	-1.202084	1.15843	-1.04	0.3	-3.48038	1.076208
Delivery						
Yes	-0.88903	0.3900602	-2.28	0.023	-1.65616	-0.1219
Suppliers						
Bucher	1.274997	0.7963965	1.6	0.11	-0.29128	2.841276
Retailer	0.1038008	0.6425034	0.16	0.872	-1.15982	1.367417
Breeder	0.8023503	0.5572719	1.44	0.151	-0.29364	1.898341
Nature Market						
Grouping	-0.522421	0.5252753	-0.99	0.321	-1.55548	0.510642

Terminal	0.5589818	0.4484886	1.25	0.213	-0.32306	1.441027
Local Nature						
Metal shed	0.1813952	1.782322	0.1	0.919	-3.32391	3.686701
Without hangar	-0.586956	0.4952186	-1.19	0.237	-1.56091	0.386994
Constante	3.572307	1.782319	2	0.046	0.067009	7.077606

Note: the OLS method was used for estimating the coefficients of the explanatory variables.

Table 4 is a summary of the significant variables.

Table 4 Summary of the coefficients of the significant variables.

Variables	**Coefficient**
Marital status	-2.09*
(Widower)	-1.07
Level of education (Traditional literate)	-1.57*
	-0.94
Level of education (Secondary)	-1.74*
	-1.05
Organization Affiliation (Yes)	3.44***
	-0.71
Payment method (Credit)	1.38**
	-0.55
Payment method (Barter)	2.59**
	-1.27
Market Location (Koira Tegui)	2.21**
	-1.07
Market Location (Tourakou)	2.30***
	-0.74
Reason for purchase (Breeding)	5.45***
	-1.69
Delivery (Yes)	-0.89**
	-0.39
Constante	3.57**
	-1.78
Observations	389
R-squared	0.23

Note: *** p<0.01, ** p<0.05, * p<0.1

4. Discussion

This study presents an R-squared of 23%. These results are higher than those of several studies conducted on qualitative variables. For qualitative variables, several authors have obtained R-squared values of less than 20% in their work. Notable mentions include [17], [18], [6] and [12].

Affiliation with an organization, purchasing motive, and market location ($p < 0.01$) are significant at 1%. Indeed, compared to non affiliation (reference value), belonging to an organization shows a superior effect. Cattle sales are higher among wholesale traders who are members of an organization.

The sales modality for breeding purposes has a significant influence on sales for slaughter taken as a reference value. Sales for breeding reasons far exceed those made for slaughter.

Regarding the market location, the Tourakou market modality has a significant influence compared to the Airport market taken as a reference value. Sales are higher among wholesale traders at the Tourakou market compared to those at the Airport market. The Tourakou market is the largest livestock market in the city of Niamey.

The mode of payment in cash and by barter, the location of the market (Koira Tegui), and delivery after the sale are all significant ($p<0.05$) at 5% compared to the values taken as reference.

In terms of the mode of payment, the cash and barter modalities have a positive effect compared to the reference value (credit). Cash and barter payments positively impact sales compared to credit payment. It can be concluded that compared to credit, cash and barter sales are more significant.

Regarding the location of the market, the Koira Tegui market has a higher effect (positive coefficient) compared to the reference value (airport market). The presence of wholesale traders at the Koira Tegui market positively impacts sales compared to the airport.

As for post-sale delivery, it has a lower effect compared to no delivery (reference value). The modality negatively impacts sales compared to the reference value. Post-sale delivery is less important than no delivery.

The Widow status has a lower effect (negative coefficient) compared to the reference value (single). The presence of widowed merchants negatively impacts sales compared to singles. Sales are declining among widowed merchants.

The education level variable, where the Traditional Literate and Secondary modalities have a lesser impact on sales compared to the reference value (Arabic Literate). Indeed, sales are less significant among Traditional Literate and Secondary individuals than among Arabic Literate individuals.

Ultimately, sales are primarily determined by marital status (widowed), affiliation (yes), the reason for purchase for breeding purposes, the market location (Koira Tegui and Tourakou), after-sales delivery (yes), education level (traditionally and secondary literate), and payment in cash and barter.

These results demonstrate the importance of non zoothechnical factors in the process of cattle sales by wholesale traders. Therefore, the analysis of the determinants of livestock sales should not be limited to zoothechnical factors. A comprehensive analysis of the determinants of live cattle sales requires consideration of non zoothechnical factors.

- [15] reported the importance of the selling period for young cattle in the context of livestock marketing.
- [8] reported the significant influence of marital status and the involvement of producers at the organizational level.
- [3] mentioned a significant influence of education level on beef production for the market.
- [7] and [2] also stated a significant influence of education on the supply of agricultural products in the market.

5. Conclusion

The importance of sales is observed at the level of wholesale traders affiliated with an organization and widows. Sales are also determined by the purchase of cattle for breeding, the location of the livestock market (Koira Tegui and Tourakou), post-sale delivery, the level of education (Traditional literate, secondary), and the mode of payment in cash and barter.

This study shows the importance of non zoothechnical factors in the process of cattle sales. Thus, in the context of determining the factors that have a significant influence on the sale of animal products, it is essential to consider both zoothechnical and non zoothechnical variables.

Indeed, the results of studies focusing solely on zoothechnical factors are partial. Therefore, it is also important to pay attention to those studies oriented towards non zoothechnical factors.

A better functioning of the beef cattle sector is essential to achieving food sovereignty. Continuing similar studies will provide complete results that serve as decision-making tools.

Compliance with Ethical Standards

Acknowledgments

The author would like to express his gratitude to the Niamey Regional Livestock Directorate and all livestock traders in the Niamey urban community who authorized the research and agreed to complete the questionnaire so that it could be conducted.

Disclosure of conflict of interest

The authors declare that they have no conflict of interest to declare.

Statement of informed consent

Informed consent was obtained from all study participants.

References

[1] Abdoulaye M, Alhassane Y. 2019. Marketing of sheep in the Maradi region: The role of intermediaries and profit margins. African Journal of Livestock and Veterinary Medicine. 12 (3) 45–60.

[2] Addisu H. 2016. Value chain analysis of vegetables: The case of Ejere district, West Shoa Zone, Oromia National Regional State of Ethiopia. MSc Thesis. University, Haramaya. p. 162

[3] Adunea D, Bezahagn A, Azeb L, Muhammed S. 2019. Beef cattle value chain analysis: Evidence from West Hararghe Zone of Ethiopia. Int J Agric Sc Food Technol. 5 (1): 077-087.

[4] Amadou A M. B. 2020. Analysis of zootechnical performances and economic contribution of pastoral livestock farming: Case of the Bermo department in Niger. Unique Doctoral Thesis. p.181.

[5] Amadou AM.B, Chaibou M, Yahaya A, Issa H. 2018. The role of commercial cattle farming in the economy of pastoral households: case of farmers in the Bermo area in Niger. Journal of Animal & Plant Sciences 35 (2) 5639-5650.

[6] Arthur EP. 2009. Griffith University Nathan, Australia. A Meta-Analysis of the Five-Factor Model of Personality and Academic Performance. 135(2):322-38.

[7] Ayelech T. 2011. M.Sc. Thesis. Market Chain Analysis of fruits for Gomma Woreda, Jimma Zone, Oromia National Regional State M.Sc. Thesis. Haramaya University. p. 127

[8] Bultossa TW, Amsalu BB, Daniel MA. 2023. The Determinants of Beef Cattle Market Participation on Beef Cattle Producers' Welfare: A Case Study of West Shewa Zone, Oromia Region, Ethiopia. Advances in Agriculture. https://doi.org/10.1155/2023/8822032

[9] Christopher N.B, Andrew P.G, Karen L.D. 2020. Evaluation of Optimal Purchase and Sale Decisions for Replacement Heifers in Beef Cattle. Agricultural Finance Review. Department of Agricultural and Resource Economics, University of Tennessee 81 (3): 430-443.

[10] Dagnelie P. 2011. Statistical Inference in One and Two Dimensions. Volume 2. Brussels, De Bock, 736 p.

[11] [11] Economic Community of West African States (ECOWAS). 2021. What are the prospects for the evolution of contributions from mobile livestock systems to the regional economy and livestock value chains in West Africa? p. 45

[12] Felicia AH. 2009. Psychological Well-being: Evidence Regarding its Causes and Consequences. Applied Psychology: Health and Well-being. Institute, University of Cambridge, UK. 1 (2) 137–164.

[13] George UY. 1897. "On the Theory of Correlation, Journal of the Royal Statistical Society. 1897 (60): 812–854

[14] HC3N. 2022. Prospective analysis of the meat value chain (cattle, sheep, goats) in Niger 2021-2030. p.172.

[15] Hugh N.Mc, Fahey A.G, Evans R.D, Berry D.P. 2010. Factors associated with selling price of cattle at livestock markets. Animal. 4 (8) 1378–1389

[16] Ly. C. 1999. The Tabaski sheep: explanatory factors for the selling price. Tropicultura, 3 (13) 105-108.

[17] Marianne B, Sendhil M. 2004. "Are Emily and Greg More Employable than Lakisha and Jamal? A Field Experiment on Labor Market Discrimination." American Economic Review. 94 (4) 991-1013.

[18] Michael M. 2004. Impact of socio-economic status on health: Status Syndrome Significance. 1 (4) 150–154

[19] Ministry of Agriculture and Livestock. 2025. Directorate of Statistics: Statistical Yearbook 2020-2023. p .413.

[20] Ministry of Livestock. 2014. Atlas on livestock in Niger. Volume 1. Livestock in Niger: a wealth without limits. p .138

[21] Oumarou D. 2018. Impact of exports to Nigeria on the sheep sector in Niger. PhD thesis, Abdou Moumouni University.

[22] Sadibou S, Babacar F, Amsatou T, Babacar D, Abdoulaye KA. 2021. Study on the marketing of cattle in Senegal. UP, Series Sci. Nat. Agron. 11 (2) : 15-26

[23] Salifou K. 2018. Analysis of the sale by weight of cattle: case of the pilot livestock market of Gothèye in Niger. p.66

[24] Toure G, Ouattara Z, Yapy-Gnaore V, Yo T, Tanoh K.G. 2005. Marketing of sheep in Bouaké, Côte d'Ivoire: price variations in the small ruminant market: Review of Animal Husbandry. Vet. Med. Trop. Countries. 58 (1-2): 95-101

[25] United Nations Food and Agriculture Organization (FAO) & Economic Community of West African States (ECOWAS). 2021. Assessment of cattle-meat value chains in West Africa: Case of Niger. FAO. http://www.fao.org/3/cb3991fr/cb3991fr.pdf.

[26] World Bank. 2020. Pastoral Dynamics and Resilience in the Sahel: The Case of Niger. Report No. 33352. https://openknowledge.worldbank.org/handle/10986/33352