

ORIGINAL RESEARCH

Main Reasons for Seizure Encounters in Abéché's Slaughterhouses-Chad

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Received: 03 Mars 2019 / Revised: 20 May 2019 / Accepted: 25 May 2019 / Published online: 27 June 2019

Abstract

A slaughterhouse serving as a butchery building can be a source of valuable information on the incidence of diseases and animals' conditions. Diseases cause economic losses in the cattle industry, mainly through mortality, seizure of organs and carcasses, reduction of meat production and increase expenditure for the animal's treatment. It also exposes the consumer to several dangers. The objective of this study was to identify the main reasons for seizures at the Abéché slaughterhouse in Chad. This was a retrospective and cross-sectional study of all cattle, camels, sheep and goats that were slaughtered daily by butchers over the period 2012 to 2016. Questionnaires were developed to collect the data. Data included specie, sex, age and race of the animals, as well as carcasses and organs suspected to be infected. All carcasses found unsuitable for human consumption were seized after ante-mortem and post-mortem inspections. The partial seizure concerned viscera with lesions. Carcasses of cattle, camels, sheep and goats were also inspected. The reasons for seizure were Tuberculosis (82.35%), Echinococcosis (11.76%) and Cysticercosis (5.88%). Tuberculosis concerned cattle and sheep while Cysticercosis and Echinococcosis were found in cattle and goats, respectively. The partial seizure concerned the livers and lungs of all carcasses. Significant differences were observed in the infection of bovine carcasses with tuberculosis and cysticercosis and, on the other hand, the most affected organ was cattles' livers followed by the lungs. The losses recorded in total seizures were about 1041.30 kg.

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Practical Applications

It is urgent to continue the fighting against illegal slaughter and to carry out a rigorous sanitary control on slaughterhouses and butchers.

Keywords: Seizures, Slaughterhouse, Control, Abéché, Chad.

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1. Introduction

In Abéché's cities, meat and meat products are widely consumed because of their virtues (high protein, fat, vitamins, iron, etc.). Unfortunately, these commodities are also at the origin of the transmission of Zoonosis that leads to significant economic losses (Hadjer, 2014). The diseases cause economic losses in the cattle industry, mainly through mortality, seizure of organs and carcasses, reduction of meat production and increase of expenditure in animal treatment (Rahmeto *et al.*, 2008). According to Jemal & Kebede (2016), a slaughterhouse serving as a butchery can be a source of valuable information on the incidence of diseases and the condition of some animals. Some of them can be zoonotic. The production loss of the livestock industry in the world is estimated to be more than USD 900 million a year (Ezana, 2008; Abebe and Yilma, 2012). Some diseases are caused by the consumption of unhealthy meats (Diarrassouba, 2011). For example according to Rostami *et al.* (2017), Trichinellosis is one of the most important foodborne zoonotic diseases distributed worldwide. Additionally, if all problems related to slaughterhouse hygiene are not well identified, this could lead to cross-contamination. Few studies have been done to understand the importance of these diseases transmission methods. It is therefore appropriate to make a state of art to apprehend the various reasons for seizures, which are of important for public health. The general objective of this study was to identify the reasons for seizure of infected meat in order to remove them from the distribution circuit and to assess hygienic practices from the production to the distribution circuit.

2. Material and methods

2.1. Study area

This study was carried-out in slaughterhouses of Abéché in Chad, from July 1st to October 30th, 2016, with a retrospective collection from 2012 to 2016.

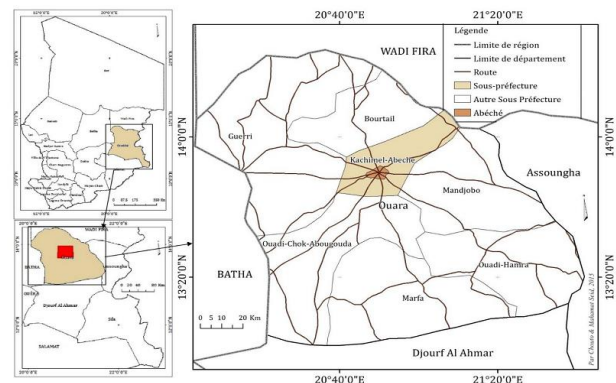


Figure 1: Location map of the study area (Mahamat, 2015)

The choice of the study area is strategic because the town of Abéché (Figure 1) is a breeding area with important slaughtering activities. Abéché is a veritable market centre for the outside world. Its population depend of agriculture, livestock, crafts, picking and trade. The climate of Abéché is warm, dry and continental with a very long dry season that last nine (9) months: October-June and a short rainy season of three (3) months: July-September.

2.2. Material

The materials used in this study were: Monthly and annual reports of slaughtering and seizures of the Abéché's slaughterhouses (2012-2015); Investigative materials (investigation Sheets and digital appliance) and usual equipment (gowns, gloves, boots, knives, mufflers, disinfectants, lime, stamp, value documents and slaughter records).

2.3. Sampling and data collection

From the 1st to the 30th of July 2016, 17292 animals (3466 cattle, 233 camels, 8096 sheep and 5497 goats) were inspected and data collected.

2.4. Investigation and maintenance method

The study was conducted using previously designed questionnaires. It was focused on animal's specie, sex, age and race. In addition, information on carcasses and organs suspected to be infected were collected. The sanitary inspection of the meat, the failures to respect good hygienic practices and the disease incidence were evaluated.

2.4.1. Technical methods

The technical methods used to achieve reliable results followed the logic below:

Ante mortem inspection of the general state of slaughtered animals, the isolation of sick or infected animals, as well as the overworked in a lazaret.

Post mortem inspection and seizures (partial or total) involved several organs after bleeding and preparation of the carcass : First the spleen (Research of anthrax, infectious diseases, miliary tuberculosis lesion); then the liver (moats, cysts, abscesses, tuberculosis lesions); lungs (tuberculosis lesions, congestions, hepatization, tumor, cysts, abscesses, edema, pneumonia, peripneumonia); heart (cysticerci, pericarditis lesions); kidneys (renal calculus, parasitic cysts, abscess); psoas nets or muscles (cysticerci); carcass (fattening, staining of meat, alteration or lesions of Arthritis and edema); muscles of the thighs and shoulders (cysticerci); pre-scapular, pre-crural and retro-mammary lymph nodes or nodes (to see if the pathology did not invade the entire carcass);

head and tongue (cysticerci, rinderpest, foot-and-mouth disease); and finally intestines (lesions of tuberculosis, enteritis and parasites). In case of pathology, the seizure can be either partial or total.

As far as denaturation is concerned, the seized meat is cut into pieces, sprayed with cresyl, petroleum or waste oil and incinerated.

2.5. Data collection and analysis

The variables used were the number of animal slaughtered by species, age, sex, race and the different reasons for seizures encountered. The data were collected and analysed using Microsoft Excel 2007 as software.

3. Results and Discussion

3.1. Results

3.1.1. Number of animals slaughtered by species from 2012 to 2016

Results showed that in 2016, the slaughter of small ruminants was higher than those of cattle and camels compared of previous years. On the other hand, slaughter of camels in 2016 was lower than that of other years (Table 1).

3.1.2. Slaughter of animals at Abéché from July to October 2016

The monthly slaughter curve of animals is presented in Figure 2.

The number of sheep slaughtered was higher in October and was significantly low in august and September than in July.

The number of slaughtered goats gradually changed during the months of July, August and October. However, there was a decrease in the number of goats slaughtered in September.

The slaughter results of cattle showed a gradual and increasing evolution from July to

October with a slight decrease in September. The monthly slaughter of camels was fluctuating with the months. The number of Camelins slaughtered in July was slightly higher than those slaughtered in August and September, while it was significantly higher in October compared to the other months.

Table 1: Number of animals slaughtered at the Abéché's slaughterhouses from 2012 to 2016

Years	Animals			
	Sheep	Goats	Beef	Camels
2012	6276	4457	3154	318
2013	7943	5697	2727	336
2014	7938	5903	3125	453
2015	8066	5123	3319	262
2016	8096	5497	3466	233

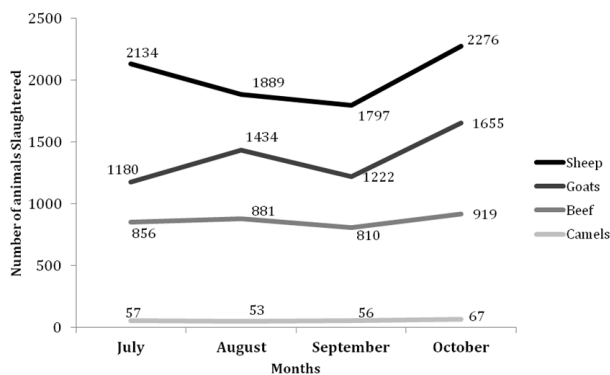


Figure 2: Monthly evolution of slaughter at the Abéché's slaughterhouses in 2016

3.1.3. Number of carcasses seized, according to the species and reasons

The rate of carcass seizures per specie and patterns is presented in Table 2. A total of 17 seizures were recorded, most of which were relate to tuberculosis.

Table 2: Number of carcasses seized at the Abéché slaughterhouses from July to October (2016)

Species	Reasons			Total
	Tuberculosis	Echinococcosis	Cysticercosis	
Beef	06	00	01	07
Camels	00	00	00	00
Sheep	08	00	00	08
Goats	00	02	00	02
Total	14 (82.35%)	02 (11.76%)	01 (5.88%)	17 (100%)

In terms of number of animal infected, the species were more concerned with bovine tuberculosis (86%) against a cysticercosis infestation which was 14% (significant difference: $X^2 = 75.414$, $ddl = 1$, $p = 0.001$). However, in terms of carcasses seized, 06 carcasses of cattle seized were infected with tuberculosis against 01 infested with cysticercosis and 08 carcasses from sheep seized were infected with tuberculosis compared with 00 infested (not significant difference: $X^2 = 1.224 < 02$, $ddl = 1$, $p = 0.20$).

3.1.4 Reasons for total seizures of bovine carcasses (2016)

The rate of total seizure of bovine carcasses is shown in Figure 3.

This figure gives the reasons (Suspicion of Tuberculosis and Cysticercosis) that led to the total seizure of 7 carcasses of cattle.

3.1.5. Reasons for seizures of organs (liver, lungs and other organs) in cattle

From more than 950 livers of cattle inspected, parasitic cysts and distomatosis were the main causes of liver seizures. As far as the lungs are concerned, congestion, emphysema, and reluctance were the main reasons of seizures. Compared to the other reasons for cattle seizures at the Abéché slaughterhouses, canker sores, head abscess, masseur cysticerci and renal cysts accounted for 30, 21, 14 and 12%, respectively (Table 3).

Table 3: Reasons for seizures of cattle organs at the Abéchés’ slaughterhouses in 2016

Organs	Reasons for seizures	Number	Percentage (%)
Livers (N=956)	Parasitic cysts	533	56
	Distomatose	309	32
	Cysticercosis	109	11
	Abscess	05	1
Lungs (N=1030)	Congestion	561	54
	Emphysema	316	31
	Repugnance	147	14
	Abscess	06	1
Others reasons (N=809)	Mouth ulcers	246	30
	Abscess of the head	169	21
	Masseur cysticeici	113	14
	Kidney cysts	93	12
	Cysticerci of the tongue	84	10
	Nephritis	69	9
	Abscess of the tongue	16	2
	Pericarditis	11	1
	Cysticerci of the heart	08	1

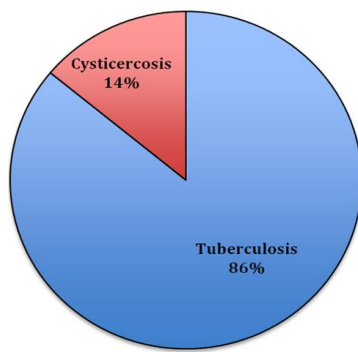


Figure 3: Reasons for total seizures of cattle carcasses

3.1.6. Seizures of organs (liver and lungs) in camels

The main causes of seizures in camels were Echinococcosis for both liver and lungs (Table 4).

Table 4: Patterns of liver seizures and lungs of camels at the Abéchés’ slaughterhouses in 2016

Organs	Reasons for seizures	Number	Percentage (%)
Liver (N=70)	Echinococcosis	64	91%
	Parasitic cysts	06	9%
Lungs (N=30)	Echinococcosis	30	100%

3.1.7. Reasons for seizures of livers and lungs in sheep

In sheep, parasitic cysts, hepatitis and necrosis accounted for more than half of the seizure pattern of the livers. For the lungs, the main causes were congestion followed by emphysema (Table 5).

Table 5: Reasons for seizures of liver and lungs from sheep at the Abéché's slaughterhouses in 2016

Organs	Reasons for seizure	Number	Percentage (%)
Liver (N=2267)	Parasitic cysts	1062	47%
	Hepatitis	389	17%
	Necrosis	271	12%
	Echinococcosis	238	10%
	Hydatid cysts	201	9%
	Abscess	106	5%
Lungs (N=2940)	Congestion	2007	68%
	Emphysema	588	20%
	Repugnance	329	11%
	Abscess	16	1%

3.1.8. Patterns of seizures of livers and lungs in goats

In goats, parasitic cysts, hydatid cysts and hepatitis accounted for more than half of the seizure pattern of the livers. While congestion and emphysema were the causes for seizures of lungs (Table 6).

3.1.9. Production, consumption and losses

The production, consumption and losses of Abéché's slaughterhouses are summarized in Table 7, but total seizures and partial seizures are summarized in Table 8.

Tables 7 and 8 provide information on the overall meat production (663 156.60 kg), total losses (15 093.58 kg) and the estimated quantity of consumption of four (4) months (648 063.02 kg), time allotted to our internship. We estimated the average cost of the kg of meat at 1250 F CFA and the offal of all species confused at 2000 F CFA. The amount of the losses amounts to Thirty million,

seven hundred and seven thousand eight hundred and ten CFA francs (30,707,810 CFA francs) for the four months provided, precisely for an annual amount of ninety-two million one hundred and twenty-three thousand four hundred and thirty francs CFA (92, 123, 430 CFA francs).

Table 6: Grounds for seizures of liver and lungs from goats at the Abéché slaughterhouse in 2016

Organs	Reasons for seizures	Number	Percentage (%)
Liver (N=1644)	Parasitic cysts	629	38%
	Hydatid cysts	400	24%
	Hepatitis	263	16%
	Echinococcosis	206	12%
	Necrosis	106	6%
	Abscess	60	4%
Lungs (N=2799)	Congestion	1987	71%
	Emphysema	483	17%
	Repugnance	176	6%
	PPCC	135	5%
	Echinococcosis	18	1%

Table 7: Summary of Production, Consumption and Losses

Animal	Production (Kg)	Quantity delivered for consumption (Kg)	Losses (Kg)
Cattle	444687.8	434185.7	10 502.10
Camel	31874.40	31309.4	565
Sheep	120630.40	117996.25	2 634.15
Goat	65964	64571.67	1 392.33
Total	663 156.60	648 063.02	15 093.58

3.2. Discussion

This study being retrospective and transversal, has permitted to obtain 17 cases of total seizures and many partial seizures of 4867

Table 8: Summary of partial seizures and total seizures

Species	Partial seizures (Kg)	Total seizures (Kg)
Cattle	9604	878.10
Camel	565	00
Sheep	2514.95	119.20
Goat	1368.33	24
Total	14052.28	1041.30

livers, 6769 lungs and 809 various organs all species included:

- ❖ Cattle: 6 cases of Tuberculosis and 01 cases of Cysticercosis;
- ❖ Sheep: 8 cases of Tuberculosis;
- ❖ Goats: 02 cases of Echinococcosis;
- ❖ 956 livers, 1030 lungs and 809 other organs of cattle with parasitic cysts, cysticercosis, congestion;
- ❖ 3911 livers and 5739 lungs of sheep / goats were seized for parasitic cysts, congestion, echinococcosis and abscess.

The methods of prophylaxis vary according to the zones (Hadjer, 2014). For this reason, the results presented above were compared to that of other authors. These results are significantly different from those of Gueye (1981) who worked in a Cape Verde region where he found no cases of seizures of related to bovine tuberculosis or cysticercosis. According to this author, prophylaxis and therapeutic methods are well mastered in that area. Djao (1983), who conducted similar work in Cameroon found a total seizure rate of bovine tuberculosis of 64.63%. These figures are certainly high, but remain lower than those obtained in this study. With regard to Cysticercosis, this author found a percentage of total seizure patterns of 3.54%. Mohammed *et al.* (2018) have conducted similar work in

Ghana in 2016 and obtained a percentage of total seizure due to bovine tuberculosis of 40.63%. These results are lower than those obtained in this work which was 86%. As far as Cysticercosis is concerned, no case of seizure was related to this pathology. Malley (2001) who conducted similar work in Ivory Coast reported that tuberculosis ranks first in total seizures with a percentage of 49.79%. In contrast, Cysticercosis has not been reported. The results of this author are high, but still lower than those obtained in this work. He explains this high tuberculosis rate with the prophylaxis methods that have not been systematic. Atawalna *et al.* (2015) have previously reported similar results with that registered in this study showing that tuberculosis is the primary reason for seizure of meat. They also reported that other reasons are Cysticercosis and jaundice. Diarrassouba (2011) who carried out similar study in Abidjan reported a percentage of total seizure due to tuberculosis of 47.42%. According to this author, this is the first reason for total seizure, which is consistent with the results obtained in this work. On the other hand, in terms of Cysticercosis, the rate obtained is very low (around 0.11%). This author explains his high percentage of tuberculosis by the fact that the prophylaxis is not systematic. For partial seizures in the liver, we obtained the following seizure patterns: Parasitic cysts (56%), Distomatosis (32%), Cysticercosis (11%) and abscess (5%). The motility rate of Distomatosis (32%) could be explained by the fact that many animals came from swampy areas, Lake Chad and its tributaries. Malley (2001), in Ivory coast reported partial seizures of organs from cattle with the following pathologies: Abscess (2%), Miliary abscess (0.2%), Distomatosis (24%), Cysticercosis

(0.2%), Degeneration (0.9%), Echinococcosis (1.5%), Tuberculosis (20%) and Cirrhosis (0.5%). This author found more reasons than ours. With regard to the Distomatosis our results are superior to those of this author is (32%) against (24%) as well as for Cysticercosis with a rate of (11%) against (0.2%). Above all, for the Distomatosis the high figures registered in this work can be explained by the fact animals were from different origins. Those from Abidjan came from the forest while those of this study came from lake Chad and its tributaries. The results obtained with the lungs were: Congestion (54%), Emphysema (31%), Repugnance (14%) and Abscess (1%). In Chad, this can be explained by the fact that the slaughtered cattle were old and Emphysema is a chronic and frequent disease found on them. As far as the abscesses are concerned, results from this work gave a rate of 1% against 5.11% as reported by [Malley \(2001\)](#). However, this author did not reported on reluctance in these reasons. In contrast, he did not detect the following patterns that were found in this study: Canker sores (30%), Head abscess (21%), Masseur cysticercosis (14%), Kidney cysts (12%), Cysticerci of the tongue (10%), Nephritis (9%), Pericarditis (1%), Cysticerci of the heart (1%). Concerning lingual Cysticercosis, the data obtained in this study (10%) was higher than those of [Malley \(2001\)](#) (2%). In Pericarditis, this reason caused a seizure of (1%) against (2%) for [Malley \(2001\)](#). Finally, cardiac cysticercosis was a reason for seizure of (1%) against (0.4%) according to this author. [Langtar \(2009\)](#) mentioned the partial seizures made in slaughterhouses in Chad without quantifying them. However, he sounded the alarm about the economic losses caused by these seizures. [Diarrassouba \(2011\)](#) has

identified numerous cases of reasons for seizures provoking partial seizures at slaughterhouses in Abidjan. In cattle, he cited as motives the miliary abscesses, Bronchopneumonia, Distomatosis, Cysticercosis, Degeneration, Echinococcosis, Emphysema, Pericarditis, Pneumonia, Pleurisy, Splenomegaly, Tuberculosis, Cirrhosis and Congestion. These patterns were identified in the lungs, heart, kidneys, spleen, liver, tongue and muscle. This author listed a large number of reasons, but not all: canker sore, abscess of the head, Cysticercosis of the masseters, renal cyst and nephritis. Concerning the reasons for seizures encountered in both cases, we can say that Cysticercosis was found in these results was about 10% whereas this author found a rate of Cysticercosis cardiac of 0.78%. As far as Pericarditis is concerned, it was found to be 1% in this study. The 2.54% given by [Diarrassouba \(2011\)](#) is slightly higher than that obtained in this work. [Gueye \(1981\)](#) found a very large number of partial seizures (19), the most dominant being Distomatosis (28%) and pulmonary Congestion (2.57%). In Cameroon, [Djao \(1983\)](#) obtained in cattle a percentage of seizures of 58.59% related to tuberculosis which is higher than 86% found in this study; and a rate of 37.57% for Cysticercosis which is also higher than 14% found in this same work. According to this author, the partial seizures of offal were dominated by Distomatosis, Tuberculosis and congestion which are in line with our findings. [Mohammed et al. \(2018\)](#) in a study conducted in Ghana in 2016 highlighted the importance of tuberculosis and pleural pneumonia in Tamale's slaughterhouse. As far as this work is concerned, no case of contagious bovine pleuropneumonia was detected. In Morocco, [El Kirdi \(2010\)](#) showed that the major seizures

reasons in cattle were mainly foot-and-mouth disease, rabies, tuberculosis, brucellosis, anthrax and symptomatic anthrax. Rabies is represented 33%, Tuberculosis 30% which were respectively lower than 86% found in this study; and Brucellosis bovine 30%. These results are significantly different from those obtained in this investigation because Charbonnous Fever, Symptomatic Charcoal, Brucellosis and Rabies have not been observed.

Studies conducted in sheep and goats:

- ✓ In July - October 2016, there were 10 reasons for total seizures, including 8 in sheep (Tuberculosis) and 02 in goats (Echinococcosis).
- ✓ In 2012 and 2013, during the same period, no case of total seizure was observed in sheep and goats.
- ✓ In 2014, for the same period, 32 cases of total seizure in sheep (Tuberculosis) and 03 cases in goats (Echinococcosis) were reported.
- ✓ In 2015, five (5) cases of total seizure were reported for the same period. Depending on the year, we found that there is a clear difference in the reasons for total seizures. These differences could be related to the origin of sheep and goats slaughtered at Abéché's slaughterhouses.

Partial seizures of liver are represented by parasitic cysts, hydatid cysts, echinococcosis, hepatitis, necrosis and abscess with a total of 2267 pieces in sheep and 1664 pieces in goats. With regard to the lungs the motives for seizures concerned the congestions, the Emphysema, the repugnant and the abscesses with a total of 2940 pieces in sheep and 2799 in goats. In Moundou, previous studies conducted by [Zakaria \(2005\)](#) gave different results dominated by partial seizures whose

main reasons were congestion and caseous diseases (lungs), Sclerosis, Degeneration, Cysticercosis, Caseous diseases (liver); while at the level of the intestine the motives were Tapeworms and Oesophagostomies. These results are different from those reported in this study may be because the work was carried out in the Sudanian zone, which is hostile to livestock. However, recent research by [Hadjer \(2014\)](#) has sounded the alarm that consumption of these animals is a public health problem. Therefore she observed and photographed several cases presenting numerous reasons for t seizures. In Abéché, the results obtained in this work were similar to those of [Breme \(2005\)](#), who obtained the same reasons of seizures, but variations were quantitative. As far as the lungs are concerned the same reasons were encountered with the exception of PPCC (Contagious Caprine Pleuropneumonia). These results are different from those of [Breme \(2005\)](#) who reported no case of total seizure. During this study, we made a total seizure of two (2) goat carcasses. With regard to partial seizures of the liver, the partial seizure reasons were similar to those of [Breme \(2005\)](#). The reasons found for the lungs are different from those obtained by this author. He reported a case of eight (8) pericardites.

Result of this study on the reasons for seizures of the goats gave two (2) carcasses following a disseminated Echinococcosis. For partial seizures of the liver, the main motives were Parasitic Cysts, Hydatid Cysts, Echinococcosis, Hepatitis, Necrosis and abscesses. For the lungs, the main reasons were: Congestion, Emphysema, Repugnance, PPCC and finally Echinococcosis.

According to [Hadjer \(2014\)](#), the slaughter areas are quite numerous in the southern zone and the non-respect of implantation rules and

operations exposes the animals to many contaminations. She therefore reported that non-compliance with this principle is a source of exogenous contamination. Finally, the non-systematic ante-mortem examination leads to the slaughter of animals whose main reasons for seizures are: Caseous disease, Schistosomiasis, Cachexia and Melanosis.

During these investigations, no total seizure was made in Camelin species. However, partial seizures were observed. In this case, out of (70) livers seized, 64 cases of Echinococcosis and 06 cases of parasitic cysts were found. Finally, only 30 cases of Echinococcosis occurred in the lung. Breme (2005) in the same study area and during the same period obtained different results with Necrosis in the liver as well as Congestion in of the lungs. These different reasons are closely related to the slaughter of this species. Indeed, camels are not consumed in Chad, they are sold in North Africa and the Middle East. Recently, eating habits have slightly changed. Camelin that was rejected by consumers began to be appreciated by the population. Very poor literature in relation to this animal species is available. Our study showed that the hygiene of personnel and equipment in Abéché's slaughterhouses is not respected at all. Such practices were described by Mbemba (2003) in Senegal and were shown to be far from meeting the requirements of the legislation of the countries concerned. It should be noted that other studies carried out in slaughterhouses in Benin have shown that the bacteriological quality of carcass and meats degrades from the slaughterhouse to the shop. These studies indicate that the high bacterial loads noted are indicative of poor hygienic practices (Salifou *et al.*, 2013a). Microbial contaminations are

also observed during meat processing on carcass surfaces (Salifou *et al.*, 2013b). Among the bacteria, Enterohaemorrhagic *Escherichia coli* (EHEC) can cause severe human illnesses like bloody diarrhoea and haemolytic uraemic syndrome. For Caprioloi *et al.* (2005), the epidemiology of EHEC infections has remarkably changed during the past ten years and an increasing number of unusual food vehicles have been associated with human infections. New routes of transmission have emerged, like contact with animals during farm visits and a wide variety of environment-related exposures.

Suggestions

For the smooth functioning of Abéché's slaughterhouse activities and to help improve in public health, the following strategies are suggested:

- ✓ Fight against illegal slaughter;
- ✓ Training of butchers on good practice;
- ✓ Sanitary control of all slaughterhouse personnel who handle the meat and who could carry the pathogenic germs;
- ✓ Capacity building for all active staff without discrimination;
- ✓ Granting microcredit to actors in the meat sector to promote sustainable development of their profession to boost the country's economy;
- ✓ Improvement of transportation means of meat and the installation of cold facilities are essential.

4. Conclusion

It is in order to know the different reasons for seizures met at Abéché's slaughterhouses that this study was conducted. The present work shows that food from slaughterhouses is not safe because of the non-compliance with the

Ishikawa rules, which is a factor favouring cross-contamination. This work helped to make an inventory of the diseases (Tuberculosis, Cysticercosis, Echinococcosis, Distomatosis, etc.) transmissible to humans from the consumption of meat. Considerable losses in meat (1041.30 kg) and organs (14052.28 kg) were registered in this study. Faced with this critical situation, the intervention of the Regional Delegation of the Livestock through the services under its auspice remains an imperative in the prevention of seizures which constitutes a suitable solution to this problem. It is therefore desirable that veterinarians commissioned to this noble task make all necessities to provide consumers with good quality food.

Conflict of interest

The authors declare that there are not conflicts of interest.

Ethics

This study does not involve Animal Testing.

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How to cite this article: Doutoum A.A, Tidjani A, Abakar Z, Doungous D.M, Abba H. (2019). Main Reasons for Seizure Encounters in Abéché Slaughterhouses (Chad). *Journal of Food Stability*, 2 (1): 31-43