

## PREVALENCE, PREDICTORS AND FINANCIAL IMPLICATION OF CATTLE RECUMBENCY AT THE KUMASI ANIMAL MARKET, GHANA

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### ABSTRACT

*Livestock are expectedly at one point or the other transported from one place to another for breeding, sale or slaughter. Conditions of handling, loading and transportation, stress encountered during the journey and when off-loading are a major factor of recumbency and/ bruising. A survey on recumbency in cattle was conducted at the animal market of the Kumasi Abattoir Company Limited (KACL) in Kaase, in the Kumasi Metropolitan Area of Ghana. The study involved 7960 cattle transported to the slaughterhouse from local towns in Ghana as well as from neighbouring countries. Recumbent and moribund cattle were identified and information was compiled based on the regions (sources) they were transported from, as well as the varying conditions of their handling and transportation. A total of 109 cases of recumbent and moribund cattle were recorded, with an average of 5 recumbent cases per day. Study results showed that cases of recumbency involved 1.4% of the total number of cattle (7960) counted in the animal market and 5.3% of the number of cattle (2069) transported from sources with registered cases of recumbency. The study also revealed higher frequency of recumbency where animals were transported over long distances of >500km (68%); or in relatively larger batch loads of >20 animals (76%). Calculating at an assumed loss of 50% value for each case of affliction, the financial implication of cattle recumbency at the animal market of the KACL is estimated at a loss of GH¢ 54500 per month or GH¢ 654000 (approx. USD 163500) per annum.*

**Keywords:** Cattle recumbency, Slaughterhouses, Transportation, Financial losses, Ghana

### INTRODUCTION

There are growing concerns about the welfare of livestock during transportation, handling to abattoirs and slaughterhouses. During the past half century, animal production has been on the rise in developing countries (Fraser, 2008) and expectedly, livestock under transportation stress for purposes of breeding, sale or slaughter. This

transportation could either be from one farm to another, from farm to market, from market to farm or from farm to slaughterhouses or abattoirs. Transportation is associated with numerous risks and in every of these movements, certain stress related variables affect the animal's physiological state. Transport of animals for slaughter and breeding is growing due to the global marketing systems and

structural adjustments (Gebresenbet *et al.*, 2004). Animals transported to slaughterhouses are sometimes not able or willing to stand up due to compromised health, stress or other environmental or physical factors. This non-ambulatory condition caused by a variety of metabolic, infectious, toxic, degenerative and traumatic disorders is referred to as 'cattle recumbency' or 'downer cow syndrome'.

By definition, a recumbent or non-ambulatory cattle will be those that are too injured, sick or too weak to stand and walk. They are commonly also called "downers". There are two categories of downers. Those that are too weak to stand after 24 hours, but that could maintain sternal recumbency are called alert downers; while those that will not stand nor maintain a sternal recumbency are called lethargic or moribund downers (Stull *et al.*, 2007; Frimpong *et al.*, 2014). Cattle are rendered non-ambulatory because of the inhumane treatments they are subjected to.

Recumbent animals are often downgraded or completely rejected by people. This has a strong economic impact both on the farmer and equally on the butcher who purchases it to be sold as meat. Recumbent animals are often priced down and depending on the duration of recumbency, meat from such animals is often rejected, as they appear black and usually lacks keeping quality. The current study therefore investigates the prevalence, predictors and estimated economic significance of cattle recumbency at the Kumasi Abattoir Company Limited (KACL).

## MATERIALS AND METHODS

**The Study Area and Location:** The study area was the Animal Market of the Kumasi Abattoir Company Limited (KACL), which is the main cattle market for the Kumasi Metropolis and its environs. It is located in Kaase in the Kumasi Metropolitan District.

**Study Animals:** Cattle are transported from local Ghanaian towns and from neighbouring countries for slaughter at KACL. The animals are

put on sale at the animal market, which constitutes part of the KACL. Study animals for the current research were all cattle at the animal market of KACL.

**Scope of Study and Survey Methods:** The data for this study conducted from 19<sup>th</sup> January to 20<sup>th</sup> February 2016 was collected through interviews (closed and open-ended questionnaires) with 69 traders and field observations of activities during animal transportation and off-loading processes. Data collected included the source of the animals transported, conditions and handling of the animals in transport including methods of loading and off-loading of animals, and distances to the cattle market.

**Statistics:** The data collected were analysed using the Statistical Package for Social Sciences, Version 21.0 to derive descriptive statistics like frequencies and percentages, and presented in tables and graphs.

## RESULTS

The distribution of the respondents in the cattle handling business at the KACL is shown in table 1.

**Table 1: Experience of cattle handlers at the Kumasi animal market**

Length of experience (years)	No. of persons	Fraction (%)
0-10	14	20.3
11-20	30	43.5
21-30	22	31.9
31-40	3	4.3
<b>Total</b>	69	<b>100</b>

A total of 69 respondents were assessed for their length of experience and engagement in the business.

The study revealed, amongst other trends, that whilst majority of the persons investigated by the survey have basic education or lower, most are at the same time, engaged full-time in the cattle handling and trading business (Table 2).

**Table 2: Mode of service of cattle handlers at the Kumasi animal market**

Mode of service	Frequency	Fraction (%)
Full-Time	56	81.2
Part-Time	13	18.8
Total	69	100

A total of 7960 cattle and 109 cases of cattle recumbency were counted at the animal market

within the study period. The distribution of the cattle transported to the KACL animal market from outside Ghana and corresponding cases of recumbency is presented in Table 3, while the distribution of the cattle transported to the KACL animal market from local sources (towns) and corresponding cases of recumbency, with highest being from upper west, upper east and northern regions respectively are presented in Table 4.

**Table 3: Numbers of cattle transported to the KACL animal market from outside Ghana and corresponding cases of recumbency**

Sources	No. of cattle transported	Fraction (%)	No. of recumbent cases (X)	Ratio of X to number of cattle transported (%)	Ratio of X to total number of recumbent cases (%)
<b>Burkina Faso</b>					
Kaya	338	29	11	3.25	20
Manga	220	18.9	9	4.10	16.36
Bobo-Dioulasso	70	6	4	5.71	7.27
Djibo	281	24.1	28	9.96	50.91
Sapone	46	3.9	0	0	0
Leo	30	2.6	2	6.67	3.64
<b>Mali</b>					
Bamako	180	15.5	1	0.56	1.82
Total	1165	100	55		

**Table 4: Total numbers of cattle transported to the KACL animal market from local sources (towns) and corresponding cases of recumbency**

Sources	No. of cattle transported	Fraction of cattle transported (%)	No. of recumbent cases (X)	Ratio of X to number of cattle transported (%)	Ratio of X to total number of recumbent cases (%)
<b>Northern Ghana</b>					
Walewale	60	28.57	5	29.4	9.26
Yendi	105	50.00	6	35.3	11.11
Tamale	45	21.43	6	35.3	11.11
Total	210	100	17	100	31.48
<b>Upper West Ghana</b>					
Wa	182	52.91	18	62.1	33.33
Tumu	137	39.83	9	31.0	16.67
Nandom	25	7.27	2	6.9	3.70
Total	344	100	29	100	53.70
<b>Upper East Ghana</b>					
Paga	30	10.00	1	12.5	1.85
Bawku	154	51.33	2	25.0	3.70
Sandema	69	23.00	0	0.0	0.00

<b>Navrongo</b>	47	15.67	5	62.5	9.26
<b>Total</b>	300	100	8	100	14.81
<b>Ashanti Area (Ghana)</b>					
<b>Kaase</b>	35	100	0	0	0
<b>Brong Ahafo</b>					
<b>Yeji</b>	15	100	0	0	0
<b>Total</b>	904	100	54	5.97	100

The 109 recorded cases of cattle recumbency constitutes 1.4 % of the total number of cattle counted at the market over the study period, and 5.3 % of the total number of cattle transported from only sources with registered cases of recumbency (Figure 1).



**Figure 1: A recumbent cow at the animal market being wheeled for slaughter in Kumasi abattoir**

The number of cattle transported per load, as well as the distance from the source to the market was significant factors directly related to the frequency and rate of recumbent and moribund cases. The highest frequency of recumbency was recorded where cattle were transported in batches of 21 – 40 (Table 5).

**Table 5: Transported and recumbent cattle at the Kumasi cattle market**

Load per batch	Recumbent cases	Fraction (%)
<b>0-20</b>	26	23.9
<b>21-40</b>	67	61.5
<b>Above 40</b>	16	14.7
<b>Total</b>	109	100

There was higher rates of recumbency in imported cattle as compared to those from local towns; and the highest frequency of recumbent or moribund cattle was recorded amongst those animals transported over distance of >751km (Table 6).

**Table 6: Cattle transportation distances to the KACL cattle market and corresponding cases of recumbency**

Distance (Km)	Number of recumbent cattle	Fraction (%)
<b>0-250</b>	0	0
<b>251-500</b>	35	32.1
<b>501-750</b>	31	28.4
<b>Above 751</b>	43	39.5
<b>Total</b>	109	100

Loading and off-loading methods may also contribute to the occurrence of recumbency in the slaughtered cattle. The least frequency of recumbency was recorded with the use of ramps in loading and off-loading cattle (Table 7).

**Table 7: Loading and off-loading methods and corresponding cases of recumbency at the Kumasi cattle market**

Method	Recumbent Cases	Fraction (%)
<b>Ramp</b>	13	11.9
<b>Others</b>	96	88.1
<b>Total</b>	109	100

Other methods used at the abattoirs include sticks and ropes to restrain these animals, while unloading them from trucks that are ordinarily considered unsuitable for the transportation of such animals.

**Financial Loss Assessment:** Assessment of financial losses, related to recumbency and moribund cases amongst cattle, considered parameters including: the source of the animals transported, conditions and handling of the animals in transport, and distances to the cattle market. The study revealed that recumbency leads to a drastic fall in the economic value of

affected animals and average prevalent prices of cattle on the market were used as basis for calculation of financial losses.

The direct financial losses due to recumbency in cattle at the market, and the estimated annual total financial losses attributable to recumbent and moribund/comatose cases amongst the cattle at the KACL animal market in GH¢ and USD are indicated. The average price of a healthy cow at the animal market was established as GH¢ 2000; with up to 50% depreciation for severe downer, recumbent, and moribund cases. Calculating at an assumed loss of 50 % value for each case of affliction, the financial implication of cattle recumbency at the animal market of the KACL is estimated at a loss of GH¢ 54500 per month or GH¢ 654000 (approx. USD 163500) per annum.

## DISCUSSION

The current study reveals a number of factors that adversely affect the health and condition of cattle transported to the market with subsequent negative economic impact. Factors that significantly increase the risk and frequency of recumbent and moribund cases amongst cattle at market include distances and conditions of transportation, as well as methods and modes of handling animals before, during and after transportation, including stocking densities of the transport vehicles and batch loads of the transported cattle.

The study revealed that the numbers of cattle transported per load, as well as the distance from the source to the market, are directly related to the frequency and rate of recumbent and moribund cases. More so, higher rates of recumbency in imported cattle and over distance of >751km could be indication that the longer the distance covered in transporting the animals, the higher the probability of occurrence of recumbency. The use of ramps in loading and off-loading cattle for slaughter reduced frequency of recumbency.

It was observed that hitting the animals with stick and the use of ropes induced all sorts of bruises and wounds on the animals. And that, many animals of varying sizes, sex, age and temperament are packed together in vehicles,

not putting into consideration appropriate loading densities and other animal welfare factors (Grandin, 2000).

Many factors have been researched and grouped accordingly as contributory factors to cattle recumbency after transportation and prior to slaughter. These factors have been safely grouped into three categories, namely: The animal factors, vehicle and handling factors, then environmental and lairage factors. Animal factors include: Temperament, body condition score, age, sex, breed (horned or not-horned); Vehicle and handling factors include: branding of animals, loading density, size and type of vehicle, distance to be covered, road quality etc.; Environmental and lairage factors include: off-loading ramp, pen size, minimum temperature etc. (Hoffman and Lühl, 2012). It has therefore been established that pre-transport conditioning, duration of transportation, distance journeyed, environmental conditions, and lairage at the slaughterhouse are all components that affect animals negatively and reduce the economic value of the animals and their meat products (Southern *et al.*, 2006). As it stands, all the aforementioned factors are a major animal welfare issues facing the livestock industries in many developing countries (Stull *et al.*, 2007) and this had often raised concerns about the wholesomeness of meat gotten from non-ambulatory and lethargic animals, as bruise sites are considered good site for bacterial growth (Folitse *et al.*, 2017) and that prolong recumbency gives rise to pale, necrotic, fetid muscle (Stull *et al.*, 2007).

The study revealed that compromised physical condition of a cow, and specifically recumbent, moribund or comatose state directly implied a drastic fall in the economic value of a cow resulting in 40 – 50 % reduction in the selling price of a recumbent cow (Villarroel *et al.*, 2003).

**Conclusion:** The factors that significantly increase the risk and frequency of recumbent and moribund cases amongst cattle also directly imply a subsequent negative economic impact. Therefore, a number of measures could be introduced to reduce rates of cattle recumbency, including: (i) provision of infrastructure e.g.

ranches for animals at regular intervals (every 200 km) along the major routes of cattle movement, (ii) routine and proper screening of all cattle from the source to the market, (iii) establish standards for stocking density of vehicles and recommend to dealers, (iv) allowing proper resting and feeding times for the animals, (v) provision of modern abattoirs in the Northern parts of Ghana to handle slaughter and meat processing and thereby reduce live animal transporting, (vi) provision of refrigerated cargo cars for the transportation of meat instead of live animals and (vii) strongly put into consideration animal welfare and freedoms.

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