INCIDENCE OF REPRODUCTIVE WASTAGE IN IKOLE EKITI ABATTOIR

By

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IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF BACHELOR OF AGRICULTURE (B.AGRIC).

DECLARATION

I, **ARABAMBI ALIMOT BIMBO,** hereby declare to the senate that the project titled **"INCIDENCE OF REPRODUCTIVE WASTAGE IN IKOLE EKITI ABATTIOR"** is my own original work carried out by me in the department of Animal Production and Health, Federal University Oye-Ekiti, Ekiti State, under the supervision of Prof. (Mrs) A. A. Aganga, Dr. A. H. Ekeocha and Dr. F. A. Adejoro. All citations and information derived from the literature has been duly acknowledged in the text and the list of references and this work has not been submitted before nor currently in any other institution.

Arabambi A. Bimbo

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Date

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12-03-2019.

CERTIFICATION

This is to certify that this research project on the **"INCIDENCE OF REPRODUCTIVE WASTAGE FROM ABATTOIR LOOKING AT THE FREQUENCY"** was undertaken by Arabambi Alimot Bimbo of Animal Production & Health Department, Faculty of Agriculture, Federal University Oye-Ekiti, Ekiti State. In partial fulfilment of the requirement for the award of bachelor of Agriculture (BAgric).

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DEDICATION

This report is dedicated to God Almighty, the Grand Architect of the whole universe, my parents, my siblings, my relatives and friends for their support towards my academics in cash, in kind and for remembering me in their prayers.

AKNOWLEDGEMENT

ABSTRACT

Limited information exists on the magnitude of feotal wastage in slaughtered cows in Ekiti State. A six-months (February-July 2018) investigative study was conducted to gather information about the incidence of foetal wastage in slaughtered cows in Ikole-Ekiti, Ekiti State. The total number of cows slaughtered during the period was 908, reflecting an average monthly kill of 50 cows and daily slaughter of 3 cows from the three central abattoirs observed.

The results reveal that at least one out of every thirty-three (1:33) cows brought to the heard is possibly pregnant. Of the total number of fetuses culled during the survey, approximately 55.56% percent of them were females and 44.44% percent were males. this result is in line with Adama et al. (2010) who had higher incidence of higher female foetal wastage. Of the body length, the length of the female fetuses were averagely longer than the body of the male foetus. The longest average lengths of female fetuses were recorded in the month of April (26.47), June (23.40) and July (28.70) and in respectively. Whereas the longest average length of male fetuses were recorded in the month of March (13.80), April (16.93), and June (19.13) respectively.

The length of the foetus can be used to describe the age of the pregnancy, which showed that some fetuses where observed even in the second and third trimester. However, this peculiar slaughtering were occurring more during the end of the dry season.

27 foetuses were observed during the period of the research, while approximately one pregnant cow was slaughtered monthly across the abattoirs. The highest number of wasted foetuses recovered from February to May, was in the month of April, the start of the raining season.

The intentions for slaughtering pregnant cows ranging from cash constraint, inadequate capacity to diagnose pregnant cows, lack of enforced animal welfare legislation, and partly ignorance.Also, strict measures can be put in place to ensure that before any cow is slaughtered and proper routine inspection and examination be carried out on the cow to check for signs of pregnancy.

Key words:slaughter, foetal wastage, pregnant cows, inspection.

Word counts:342

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CHAPTER ONE

1.0.   INTRODUCTION

1.1   Background of the Study

Livestock is an essential resource in Nigeria, adding to improved nutritional status and the economic growth of their owners. In many African countries, livestock also plays many roles, ranging from draught power to provision of manure, milk, and meat (*Raimi et al., 2017*).

In Nigeria, some of the limitations of livestock productivity include poor unbalanced feeding, high disease prevalence and associated high neonatal mortality. Scarce breeding and husbandry system constitute significant obstacles to the promotion of large scale holdings of livestock (*Okeudo, 2004*).

Maxwell *et al.*, (2006) stated that proper economic management of animal demands that those sold for slaughter should be males and females that are reproductively inactive. Information on the reproductive status, breed, and weight of animals sent for slaughter should be continually evaluated to avoid wastage through the slaughtering of reproductively active females.

Nwakpu *et al.*(2007) observed that most abattoirs in Nigeria are not modern abattoirs where proper antemortem examination can aid the elimination or point –out unfit animals. Ante-mortem inspection is not usually carried out, therefore; resulting in a high incidence of slaughtered pregnant animals.

Demographic figures indicate that there are 19.5 million herds of cattle in Nigeria. The meat and milk obtained from this animal constitute the significant sources of animal protein to a more substantial part of the population. Animal protein intake in

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Nigeria still falls short of the 69g person per day recommended by FAO (2013). There is a need for increasing animal production and slaughter (*Adesokan et al., 2012*) due to a shortfall in animal protein contribution to per caput food availability of Nigerian (*FAO, 2013*).

There is a lack of modern facilities in a lot of abattoirs and meat processing plants in Nigeria. Also, the beef inspective service centers are not optimal, resulting in the consumption of unwholesome meat by the public. This is a major concern to all stakeholders in the industry and the general public. Pregnant animals arebeing slaughtered in the abattoir on regular bases with marked loss of fetuses which constitute an economic waste. The most significantissue about slaughtering pregnant cows is that it limits the growth of the herd size and considerableeconomic wastage is practiced.

It is most uneconomical to continue the practice of slaughtering pregnant animals, a situation that significantly threatens the Nigeria livestock industry (*Oduguwa et al., 2013*). One possible factor contributing to the high rate of slaughter of pregnant cows is the season of the year. Often, rainy period coincides with active breeding season for most livestock species due to the availability of pasture and consequently high pregnancy rates.

Although globally, the practice of slaughtering different breeds of livestock has been sustained, the pregnancy status of the animal being butchered for meat remains a hideous issue in many countries (*Warriss, 2008*). The scenario of animal slaughter in abattoirs has shown that not only the conventional non-breeding livestock are

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slaughtered for meat but also the productive pregnant and lactating ones are not left out (*Adama et al., 2011*).

These animals are either killed for daily meats or occasionally for rituals, religious festivals, ceremonies, drug formulations, disease control or to meet immediate financial needs (*Adesokan,2010*).

Livestock production is an essential aspect of agriculture because the crucial constituents of food needed for maintenance and tissue building in the body are limited in plants. Except for legumes, plant food does not contain adequate quantities of protein, and therefore animals are the chief source of protein to man; hence, the need to give extra encouragement to improve livestock production in Nigeria.

Agricultural Organization quantity of animal protein intake (3sg/person/day) and this is subject to several factors that account for the inadequate supply of meat in Nigeria, bringing less consumption of meat compared to plant sources of protein which are relatively cheaper. The animal product in the diet of an average Nigerian has been diminishing year after year due to marginal improvement in animal population and productivity (*Oyenuga, 1987*).This can be attributed to the gradual but steady loss of potentially healthy stock that is lost in the slaughter of these pregnant animals.

According to Mukasa *et al* (2006), herd productivity may be affected by a wide range of disease problems and reproductive wastages. These effects may be manifested through abortions, mortalities as well as resources involved in controlling and overcoming the impact of these diseases.

The slaughter of pregnant animals has queried the efficiency of ante mortem inspections at the abattoir, proved the need for well-equipped Veterinary services for

improved herd health management in the state and has frustrated the efforts of livestock husbandry system in increasing animal production to meet the growing demand for animal protein by a growing human population. (*Ngbede et al., 2012*).

1.2   Problem Statement

Lack of awareness of pregnant animals is a problem since farmers have less knowledge on pregnancy diagnosis (*Fayemi and Muchenje 2013*). Traditional cattle keeping involve extensive grazing system whereby cows and heifers are always mixed with bulls, and it is difficult for farmers to know when the animals are mated by bulls. Farmers in rural areas also don't keep any records of their livestock. This ends on selecting any animal for sale and increases the possibilities of slaughtering pregnant animals.

Lack of enforcement of legislation against the slaughtering of pregnant cows in some wards, livestock markets and slaughterhouses where veterinary and livestock extension officers are available, if the pregnant cows and heifers were allowed to reach full term and calves' financial value assessed at birth, the resulting losses are enormous. Furthermore, limited availability of veterinary and livestock extension services in rural areas of is another reason for selling of pregnant cows and heifers for slaughter.

The most significant effects about slaughtering pregnant cows' lies in the fact that herd population sizes are reduced and enormous economic wastages are involved, leading to colossal reduction in the national herd, loss of dairy products as well as supply of inferior quality meat product to the general public (*Alhaji, 2011; Oyekunle et al., 1992*). Farmers need to be educated on proper breeding and record keeping to

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overcome this problem.Again, at the livestock market; all animals need to be further examined for health and pregnancy beforebeing sent for slaughter. If veterinarians and livestock extension officers were available in all these setups would have significantly minimized possibilities for sending pregnant animals at the slaughterhouses.

An undesirable effect of this lapse in veterinary public health duties is the indiscriminate slaughter of pregnant animals (*Garba et al.,2010*). Today, there exists a wide disparity between the foods. The slaughter of pregnant animals in rural abattoirs is becoming a severe constraint to future livestock population. The need for adequate human nutrition cannot be overemphasized; yet, acute protein malnutrition is endemic in most developing countries (*FAO/WHO, 1983*).

The economic recession that has been witnessed in Nigeria since the 1980s has brought in its wake a deterioration in the quality and quantity of animal protein in the diet of Nigerians. This has also dictated new trends in improving the situation. This has entailed the slaughtering of not only prime breeding males but also pregnant animals resulting in foetal wastages, as reported by different workers concerning camels (*Ataja and Uko, 1994*) small ruminants (*Ogwuegbu et al., 1987*) and cattle (*Oyekunle et al., 1992*).

1.3   Justification

The indiscriminate slaughter of pregnant females and the consequent wastage of embryos and foetusesare regarded as primary destructive mechanisms that counteract food production efforts (*Alhaji et al., 2015*). The magnitude of foetal losses due to the slaughter of reproductively active dams has been reported among both large (cows)

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and small (ewes and does) ruminants from several abattoirs in the South West (*Cadmus and Adesokan 2010*), South East (*Wosu and Dibua 1999*), North Central (*Alhaji 2011; Alhaji and Odetokun 2013*), North West (*Garba et al. 2010; Muhammad, Ashiru and Abdullahi 2007*) and North East (*Bokko 2011; Chaudhari and Bokko 2000*) zones of Nigeria.

The practice of slaughtering pregnant ruminants has hurt the national herd size and total meat production, restricting the availability of animal protein. The associated economic losses constrain the contribution of livestock to the gross domestic product in the country (*Alhaji and Odetokun 2013*).

Substantial foetal calf wastage has been recorded at an abattoir in northern Nigeria (*Alhaji 2011*), which translated to an average annual financial loss of close to #104,835,000.00 (*Ngbede et al. 2012*). There is a need to investigate the reasons for the continuous slaughter of pregnant ruminants to predict associated trends and facilitate sound strategic planning and decision-making in combating future foetal livestock wastage in Nigeria.

Foetal wastage may constitute an obstacle to livestock production and economic development in Ekiti state and Nigeria as a whole. It is resulting in a direct decrease in the GDP of the state and country. Foetal wastage may also pose a health risk to health workers. The information obtained on foetal wastage and its control in our abattoirs may contribute in no small measure to increase the population of livestock in Ekiti state and Nigeria in general. Information obtained in this study will help relevant authorities and stakeholders understand the deteriorating effect of foetal wastage and how consumption of foetuses is promoting this undesirable practice in

Nigeria and its impact on the country's economy and overall welfare of the populace. It will also contribute to the knowledge on the health risks it poses to abattoir workers as well as the general public.

Adequate investigation of foetal wastage in Ikole Ekiti abattoir is necessary and imperative for practical and implementable control measures to be developed. Therefore, given the economic implication of foetal wastage to the economy and food security of our nation, there is a need for this study to fill the existing gap on the role of foetal wastage in Ikole Ekiti abattoir, Ekiti state, Nigeria.

1.4 Aim

The main aim of this research is to determine the proportion of foetal wastage and occurrence of foetuses from slaughtered pregnant cows in Ikole Ekiti abattoir, Ekiti State, Nigeria.

1.5 Objectives

The objectives of this study are to:

i. Determine the occurrence of foetal/reproductive wastage among slaughtered ruminants (mainly cows) in Ikole Ekiti abattoir, Ekiti state, Nigeria using passive and active data.

ii. Evaluate the magnitude of fetal wastages, and estimate the economic losses due to foetal wastage in Ikole Ekiti abattoir, Ekiti state, Nigeria.

1.6 Research Questions

i. Does foetal wastage occur among cows slaughtered at Ikole Ekiti abattoir, Ekiti state, Nigeria?

ii. Does foetal wastage constitute an economic loss to livestock production in Ekiti State?

CHAPTER 2

2.0. LITERATURE REVIEW

2.1 Agricultural Production in Nigeria

The role of agriculture in the economic development of most countries can hardly be overemphasized (*Timmer, 2003*). The contribution of agricultural growth to overall poverty reduction has been documented (*Sarris, 2001*). Nigeria's rich human and natural resources endowment gives it the potential to become Africa "the largest economy and a significant player in the global economy (*Nnaemeka and Nebedum, 2016*). However, the economic development in Nigeria has been disappointing. Agriculture, though largely under-developed, is the most crucial sector of the Nigeria economy after oil, of which animal production plays anessential part.

To fully revitalize agricultural production in Nigeria, the Federal Government had established series of agricultural policies (*Aigbokhan, 2001; Akande, 2006*) but have not been implemented with resultant hunger and the problem of food security has not been guaranteed (*Babatunde and Qaim, 2010; Agboola and Balciliar, 2012*).

Crop production contributes majorly to the development of the agricultural sector in Nigeria, followed closely by livestock production. Overcoming foetal wastage in the livestock sector might be the big break needed by the livestock subsector.

Although globally, the practice of slaughtering different breeds of livestock has been sustained, the pregnancy status of the animal being slaughtered for meat remains a hideous issue in many countries (*Warriss, 2008*).

These animals are either killed for daily meals or occasionally for rituals, religious festivals, ceremonies, drug formulations, disease control or to meet immediate financial needs (*Cadmus and Adesokan, 2010, 2012*).

Studies in many African countries show that many of the local cattle slaughtered in different slaughterhouses are pregnant (*Zulu et al. 2013*). This leads to foetal wastage which otherwise would have increased the cattle herds that ultimately increase the protein supply to the ever increasing human populations in African countries.

It is most uneconomical to continue the practice of slaughtering pregnant animals, a situation that dramatically threatens the Nigeria livestock industry (*Oduguwa et al., 2013*).

Although previous studies have concluded that annual foetal losses amongst cattle occur more often in the dry seasons in slaughterhouses and abattoirs across Nigeria (*Tizhe et al., 2010*).Available data supports that it occurs more during the latter part of the rainy season.

Nigeria's rich human and natural resources endowment gives it the potential to become Africa's largest economy and a major player in the global economy (*Nigerian National Planning Commission, 2004*). However, the economic development in Nigeria has been disappointing. Agriculture, though largely under-developed, is the most crucial sector of the Nigeria economy after oil, of which animal production plays a very critical part (*Odoemelam, 2011: The World Bank Group, 2011*).

In the 1960s, agriculture accounted for over 80 percent of the export earnings and employment; about 65 percent of the Gross Domestic Product (GDP) and about 50 percent of the government revenue (*Daneji, 2011*).Although, the 3675dominant role

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of crude oil has ensured a significant decrease in the impact of agricultural production in the country. This has caused a steady decline in the economic growth of the nation over the years.

2.2   Cattle Production In Nigeria

The livestock industry is an industrial enterprise for millions of herd people throughout tropical Africa, the arid, semi-arid, and sub-humid areas especially. Livestock production is essential to food security and the development of any nation. It is providing a means of foreign exchange for the economy, employment for the citizens, food (and abundant source of protein which is essential for human nutrition for the populace). It is a source of prestige; it provides income for the citizens, provides draught power and transportation, it contains raw materials for the clothing and shoe industry and by-products that can be used in industries such as the cosmetic industry amongst others (*Bamaiyi, 2012; Bhat et al. 2012*). Livestock plays a vital role the value of agricultural production, by contributing about 12.7 percent of the Agricultural GDP (*FAO, 2013*). In monetary terms, the value of Nigerian livestock resources was conservatively estimated to be approximately six billion US Dollars (*Akande et al., 2011*).

Nigeria is one of the leading countries in cattle production in sub-Saharan Africa (*FAO, 2014*).This is probably because of the perfect migratory structure devised by the northern part of the country where most of the country's cattle population is. The animals are sent down south during the dry season in search for forage and return north when the rain begins. Cattle and beef trade provides the largest market in

Nigeria with millions of Nigerians making their livelihood from various beef-related enterprises.

Cattle are ruminant animals marketed in Nigeria for their meat, milk as well as for hides and skin among other purposes. Of the Nigerian livestock population, cattle contributed about 10 percent, while in monetary terms they are accounted for about 40 percent of livestock total revenue of the country (*FOA, 2014*). However, the supply of beef and milk has failed to keep pace with the increasing population. As a result of this, widespread hunger and malnutrition are evident in the country. This calls for the adoption of all possible measures to accelerate the rate of cattle production in the country.

2.3   Challenges of Cattle Production

However, livestock production is faced with someproblems which threaten to reduce productivity and profitability in the long run. In Nigeria, cattle production is affected by factors including population growth, (*Alhaji and Odetokun 2013; Ngbede et al. 2012*), urbanization, lower economic standard of the citizens (*Bamaiyi, 2012*), infectious diseases (*Bamaiyi, 2012; Bath et al., 2012*), level of education of the farmer, season (*Alhaji, 2011; Glatze, 2002*) and indiscriminate slaughtering of pregnant animals (*Abdulkadir et al., 2008; Muhammed et al., 2009; Cadmus and Adesokan, 2010; Ardo et al., 2013*).

The greatest worry about slaughtering pregnant animal lies in the fact that many protein source waste is involved which lead to a massive reduction in the population of animal, loss of dairy product, as well as the supply of poor quality meat products to

the public (*Oyekunle et al. 2010*). This is due to the lack of legislation, especially in matters relating to abattoir operation, its construction and or meat inspection.

Guidelines and regulations in place are not being followed. There are little to no modern abattoir where proper ante-mortem checks are carried out before the slaughter of animals to identify and segregate animals unfit for slaughter.

Livestock farming and slaughter have become millenary traditions in every part of the World. The main reason for these traditions is that humans are at the top of the biological chain in the habit of meat consumption (*Okoli et al., 2005*). This, therefore, serves as the chief reason for maintaining animal populations to provide a nutritious and desirable form of food for people (*Adama et al., 2011*). Although globally, the practice of slaughtering different species of livestock has been sustained, the pregnancy status of the animal being slaughtered for meat remains a hideous issue in many countries (*Warriss, 2008*).

2.4   Food Security and Livestock (Cattle) Production

Being the most populous country in Africa with an estimated population of over 180 million, with over 70% of the people living on less than one dollar a day (*FAO, 2012*); It is estimated that by the year 2050 the projected population will be 402 million, making Nigeria the fourth most populous country on earth after India, China and the United States (*FAO, 2012*).

With a fast-growing population, Nigeria is threatened with the problem of food insecurity and poverty which can be addressed with a more developed animal production system in addition to other sectors (*Fasoyiro and Taiwo, 2012*). This has been attributed to the infancy of the livestock industry, its hydra-headed problems and

its low per capita income which leads to consumption of less than 9 grams of animal protein per capita per day as compare to over 50grams per capita per day in North America and Europe (*Boland et al., 2013*).

The common slaughtered animals for meat in Nigeria are cattle, goat, sheep, pig, and poultry. Others slaughtered animals (although less popular) includes; camel, donkey, horses, rabbit and others games and forest animals that are edible. A decrease in annual growth rate of livestock population in Nigeria (*FAO, 2013*) statistical year book of 2013 showed that there was a decline in the percentage contribution of the livestock sector to the gross domestic product (GDP).

With the rapid growth in the Nigerian population and the diminishing value of the currency (Naira) leading to the reduction in purchasing power, there is need to reduce foetal waste, which would in turn lead leads to increase in animal availability. The economic recession that has been witnessed in Nigeria since 2016 has brought in its wake deterioration in the quality and quantity of animal protein in the diet of Nigerians. This has also dictated new trends in ameliorating the situation. This has entailed the slaughtering of not only prime breeding males but also pregnant animals resulting in foetal wastages.

The slaughter of pregnant domestic animals vies-a-vies cattle, goat and sheep will no doubt worsen the already precarious supply of animal protein to the populace (*Raimi et al., 2017*). It is most uneconomical to continue the practice of slaughtering pregnant animals, a situation that dramatically threatens the Nigeria livestock industry. One possible factor contributing to the high rate of slaughter of pregnant cows is the season of the year. The rainy season creates a suitable environment for

extensively reared animals to breed. It, therefore, becomes necessary to study the pattern of fetal wastages in Ikole Ekiti as a case study.

Selling of cattle to livestock market is a common practice of farmers to get income. To get reasonable prices, farmers always select animals by facial appraisal (eyeball judgment) looking at body size or well-nourished and fat animals and sell them to cattle traders in livestock markets. Because of limited veterinary and extension services in rural areas, farmers sell animals without knowing their pregnancy status. The majority of cattle traders buys animals for slaughter and sells meat. Studies in many African countries show that many of the local cattle slaughtered in different slaughterhouses are pregnant (*Zulu et al., 2013*). This leads to foetal wastage which otherwise would have increased the cattle herds that ultimately improve the protein supply to the growing human populations in African countries.

The scenario of animal slaughter in abattoirs has shown that not only the conventional non-breeding livestock are slaughtered for meat but also the productive pregnant and lactating ones. These animals are either killed for daily meals or occasionally for rituals, religious festivals, ceremonies, drug formulations, disease control or to meet immediate financial needs (*Cadmus and Adesokan, 2012*).

Meat consumption as a major source of protein, with human beings at the top of the biological chain, is the main reason for livestock husbandry and slaughter activities in every part of the world (*Okoli et al., 2005*). The demand for livestock products in developing countries is increasing due to urbanization, changes in lifestyles especially in dietary habits and rising disposable income. Meat consumption per capita has doubled in developing countries between 1980 and 2002, and this is likely to continue

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shortly till 2030 (*Delgado et al., 1999: FAO, 2013*). Both male and female animals are slaughtered at the abattoirs/slaughterhouses for meat and meat products. It is now a trend in the abattoirs to slaughter pregnant animals for meat, rituals, religious festivals, ceremonies, drug formulation, and disease control or for financial purposes (*Fayemi and Muchenje, 2013*). Food and Agricultural Organization (FAO) estimated that global meat and milk consumption must double by 2050 to meet population growth and it was also expected that global population would be 9 billion by 2040 (*FAO, 2014*).

The growth rate of ruminant production is too slow to cope with the per capita requirements in Nigeria, the human population of Nigeria grows with an estimated 3.5% per year, and the livestock resources grow between 0.8% and 2.9% per year (*Taiwo et al., 2006*). The increased demand for animal protein in Nigeria has led to the slaughtering of not only prime breeding males but also pregnant animals resulting in marked fetal wastages in most abattoirs across the country (*Oyekunle et al., 1992*).

In Nigeria, fetal wastages have been reported by, Abdulkadir et al. (2008) in Markurdi abattoir, Benue State, and Ngbede et al. (2012) in Kaduna, these studies reveal millions of Naira was lost annually due indiscriminate slaughter of pregnant animals. Pregnancy wastage has been reported to account for about 20- 25% of the fall in livestock production in Sub-Saharan Africa (*Ngbede et al, 2012*).

A law regulating meat inspection in Nigeria has been in existence to conform to World Health Organization (W.H.O.) directives of 1962, that authorize Veterinarians the world over to be in control of meat inspection and that such duty is transferred to the veterinary department. This law (the meat edict, 1968) took effect in 1968.

However, despite the provision of this law, which legally outlawed the slaughter of pregnant animals, the practice with its financial and production implications has continued to thrive in this country.

Generally, meat inspection in abattoirs provides useful information regarding the quality of meat. However, abattoir surveys have limitations because the data may have been underestimated because of general poor record keeping (*Tembo and Nonga, 2015*).

Muhammad et al., (2008) observed that the pattern of disease infection varies with seasons and most often severe disease outbreaks were recorded during the rainy seasons. Control of foetal wastage in abattoirs will go a long way in increasing the population of livestock in Nigeria. Knowledge of the magnitude of bovine foetal wastage in slaughterhouses is therefore inevitable. This will provide the basis for justifying the human and material resources required for pregnancy diagnosis.

The need for adequate human nutrition cannot be overemphasized; yet, acute protein malnutrition is endemic in most developing countries (*FAO, 2013*). In Nigeria, this situation has mostly been due to inadequate development of the livestock sub-sector of the economy. However, it is noteworthy that other factors including proper meat inspection practices have also been contributory. An undesirable effect of this lapse in veterinary public health duties is the indiscriminate slaughter of pregnant animals (*Garba et al., 2010*). The slaughter of pregnant animals in rural abattoirs is becoming a severe constraint to future livestock population.

Nigeria, the agricultural year is divided into two major seasons, namely the rainy season (April–October) and the dry season (November–March). Foetal wastage

usually peaks in the rainy seasons or immediately afterward; this is due to the availability of suitable feed (forage) and proper nutrition that comes with this period. The animals are well fed and are usually in mating season. The sale of extensively raised cattle appears to surge during this period to recover funds lost, given the inadequate feed supply in the preceding season. Also, as no controlled breeding is observed for this livestock, pregnant animals may be sold off to an abattoir, which subsequently results in foetal wastages. Although previous studies have concluded that annual foetal losses amongst cattle occur more often in the dry seasons in slaughterhouses and abattoirs across Nigeria (*Cadmus and Adesokan, 2010*).

In most cases, meat consumers are even unaware or denied the right to know the status of the animal that is converted to meat they eat. In the past, studies have been focused on: animal right (*Galvin and Herzog, 1992*), protection of animal welfare standards (*Thornber, 2010*), conservation of animals' genetic resourcespre-slaughter stress responsiveness (*Muchenje et al., 2009a*); abattoir and slaughter surveillance (*Addass et al., 2010*), animal slaughter and meat quality.

In Nigeria, there is a lack of adherence to legislation strictly regulating abattoir construction and operation. In many states of the federation, there are no modern abattoirs where proper antemortem examination of slaughtered animals is practiced to eliminate slaughtering of pregnant cows. The most significant effects about slaughtering pregnant cows lie in the fact that herd population sizes are reduced and enormous economic wastages are involved, leading to a considerable reduction in the national herd, loss of dairy products as well as the supply of low-quality meat product to the general public (*Alhaji, 2011*).

2.5 Foetal Wastage

More recently, foetal wastages through the slaughter of pregnant animals has been associated with production problems in Nigeria (*Ardo et al., 2013; Oduguwa et al., 2013*). Literature has shown that the concept of wastage through the indiscriminate slaughter of pregnant livestock is one of the practices man has ever used against his production endeavor (*Bello et al., 2008*).

This has been observed as a critical factor responsible for protein malnutrition in some African countries and a possible constraint to future livestock populations on the continent (*Nwakpu and Osakwe 2007; Ademola. 2010; Cadmus and Adesokan, 2010*). The Food and Agricultural Organization (FAO) recommended a minimum of 35g/head/day of animal protein for good health in human population world over. However, in Nigeria, this is far beyond reach because the actual average protein consumption is 4.5g/head/day.

Today, there exists a wide disparity between the FAOs' recommended quantity of animal protein intake and what is consumed in Nigeria. This deficiency may be attributed to several factors that account for the inadequate supply of meat in Nigeria (*Alade et al., 2011*).

2.6 Economic Implication of Foetal Waste

The increasing human population is an indication that more cattle forbeef will be needed, but the destruction of young calves in the form of foetal wastage due to the slaughter of pregnant cows is a great impediment to achieving the much-needed increase. Foetal wastage has been reported to account for about 20-25 % of the fall in livestock production in sub-Saharan 12 Africa (*Chaudhari and Paul-Bokko, 2000*).

Despite reports from different parts of the country on the magnitude of foetal wastage, the problem is yet to receive a meaningful attention from the agency responsible (*Addass et al., 2010; Adama et al., 2011*). Therefore, Nigeria with a cattle population of about 15 million and a growth rate of 0.8 % needs to urgently control this practice which is producing anadverse effect on its livestock production sector (*Taiwo et al., 2011*).

The foetal calves are usually slaughtered at different weeks during their gestation ages. Some are killed from four weeks whereas others are killed even at 21 weeks which is close to calving. Between 4-21 weeks the fetuses begin to develop the head, body, legs, and other essential features.

Table 2.1: Measuring standard that may be used to determine the age of foetus

Age	Relative size	C–R Measurement	Weight	External fetal characteristics
2 mo.	Mouse	6 to 8 cm	8 to 30 gm	Claw buds and scrotum present
3 mo.	Rat	13 to 17 cm	200 to 400 gm	Hair on lips, chin, and eyelids
4 mo.	Small cat	22 to 32 cm	1 to 2 kg	Fine hair on eyebrows, claws developed
5 mo.	Large cat	30 to 45 cm	3 to 4 kg	Hair on eyebrows and lips,testes in scrotum, teats developing
6 mo.	Small dog beagle,	40 to 60 cm	5 to 10 kg	Hair on inside of ear and around horn pits, tip of tail and muzzle
7 mo.	Dog	55 to 75 cm	8 to 18 kg	Hair of metatarsal, metacarpal, and phalangeal region of extremities and beginning on back, long hair on tip of tail
8 mo.	Large dog	60 to 85 cm	15 to 25 kg	Fine short hair all over body, incisor teeth not erupted

(From Veterinary Obstetrics and Genital Diseases Theriogenology,3rd Edition, 1986, S. Roberts, p. 19)

CHAPTER 3

3.0. MATERIALS AND METHODS

3.1 Description of Study Location and Climate

The research was conducted at three central abattoirs at Ikole Ekiti local government area, located at the north-east part of the state. The abattoirs provide the daily meat requirement of the inhabitants of the area and neighboring areas.

Ekiti state is situated entirely within the tropics. It located between longitudes 40 51 and 50 451 East of the green wish meridian and latitude 70 151 and 80 51 North of the equator. The state is made up of 16 local government areas in which the total population of the state is 1,647,822. The state enjoys a tropical climate with two distinct seasons. These are the rainy season (April-October) and the dry season (November – March), temperature ranges between 210 and 280 degrees Centigrade with high humidity. The south-westerly winds and the North East trade winds blow in the rainy and dry (harmattan season) respectively.

This present study was carried out starting from February 2018 to July 2018. At maximum operation, the abattoirs have a daily maximum handling capacity of 20 heads of cattle and other small ruminant animals. However, as a result of lack of maintenance and adequate facilities, it presently slaughters around 5 heads of cattle daily.
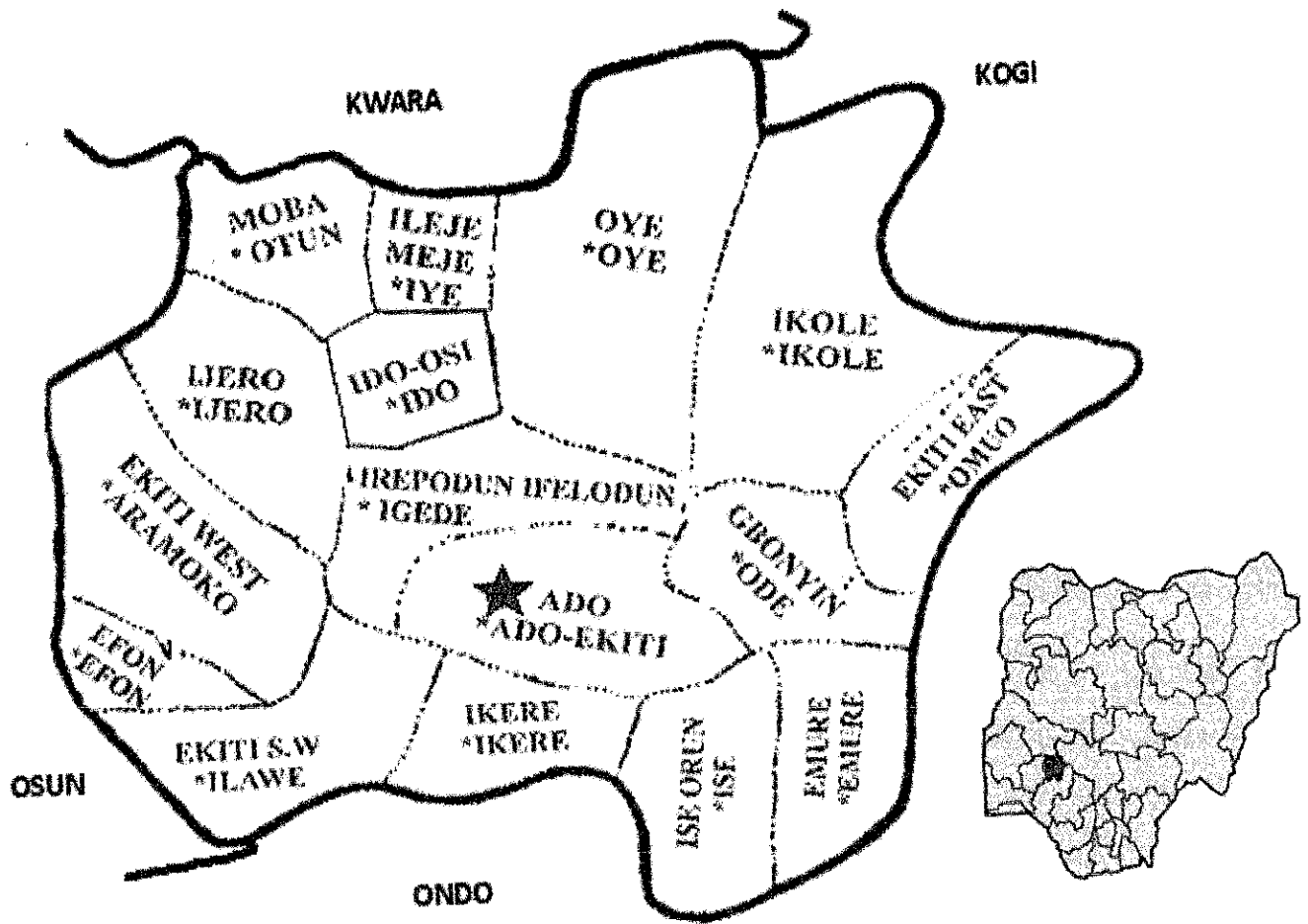
Figure3.1: *Map Showing Ekiti State, Nigeria, showing sixteen Local Government Areas* (Source: www.researchgate.net).

3.2   Study animals and design

The study animals were cows selected for slaughter from the three central abattoirs with in the area. More so, some animals were transported to the slaughterhouse while some, following the nomadic lifestyle of the farmer's trekked to the slaughterhouses. The study design utilized was an active abattoir survey and live inspection, carried out from February to July 2018. The traded female stocks were our main interest in the survey because they are concerned with gestation and calving. After arrival at the abattoirs, the sex of cattle, slaughtered animals, and foetal wastage where documented in a purposively designed record sheet. Also, determining the location of the cattle's was technically not possible for various issues, including poor farmer's record and inadequate identification techniques at market points. Pregnancy test was ignored because of lack of necessary facility and technical knowhow in the abattoirs.

3.3   Meat inspection and Data collection

Primary Data was collected at three abattoirs whose GPS locations are latitude 7.7956832, 7.7956824 and 7.7950106, longitude 5.5179359,5.5179462 and 5.517608 with an accuracy of 2500.00, 2507.00 and 2299.999 in Ikole-Ekiti, the reason being that they slaughter ruminant animals more frequently and also because they are the only functioning abattoir in Ikole-Ekiti.

Regular meat examination was carried out by the resident abattoir meat inspector. Knives were used to cut through the uterus to retrieve the fetuses using well disinfected hands. Data collected where both ante and post mortem. Data were collected daily from 5-8:00am at the time most slaughter takes place. Data collected include: total number of cows slaughter daily, number of number of foetal-wastage,

body length of female foetus, number of male foetal-waste, and length of male foetal waste.

Recouped fetuses were stratified into the classifications < 3 months (first trimester), 3-6 (second trimester) and > a half year old (third trimester) based on the length of the foetus body; this information was posted in the information accumulation frame intended for the reason.

3.4 Data Analysis

The data collected from February to July 2018 were entered, stored and analyzed using the Tukey of SAS statistical software. Descriptive statistics such as the mean of all slaughters, and the extent of foetal loss were generated. The percentage mean of foetal waste was solved as the number of fetuses recovered divided by the total number of cows slaughtered.

CHAPTER 4

4.0 RESULT

4.1   Slaughter Data

A total of 908 cows were slaughtered, reflecting an average monthly kill of 50 cows and daily slaughter of 2 cows from the three central abattoirs observed. As described based on outward appearance, 100% (908) of the cattle presented to the slaughterhouse were indigenous breed and above two years of age. The results on cows slaughtered and foetal wastage were compared across the three abattoirs is shown in table 1.

The mean of the total number of cows slaughtered was significantly different from each other, whereas the foetus wastes were insignificantly difference across the three central abattoirs. However, the body length of both female and male fetuses differed slightly in abattoir A (LFF 4.6663), (LMF 5.9388) and abattoir C (LFF 2.5449), (LMF 1.8927) respectively. This difference can be attributed unknowing the farm source and management care of the animals.

The numbers of male fetuses slaughtered were insignificantly different across the three abattoirs.

4.2   Incidence of Foetal wastage

The incidences of foetal waste were analyzed (table 1). The average loss from January to July 2018 was compared respectively. There was a monthly difference of foetal wastage at the abattoirs with highest incidence of foetus wastage in the month of March 2018.

Table 4.1: Incidence of Foetus wastage at the abattoirs from February to July 2018.

Months	Abattoirs	NFS	NFFO	NMFO	LFFO	LMFO
February	Car Wash 1	28	0	0	0.0	0.0
February	Car Wash 2	33	0	1	0.0	13.0
February	Odo Eran	98	1	1	4.7	28.4
March	Car Wash 1	32	0	0	0.0	0.0
March	Car Wash 2	43	0	0	0.0	0.0
March	Odo Eran	103	0	2	0.0	36.7
April	Car Wash 1	29	0	0	0.0	0.0
April	Car Wash 2	34	2	1	35.6	37.8
April	Odo Eran	92	2	2	43.8	13.0
May	Car Wash 1	27	0	1	0.0	19.2
May	Car Wash 2	41	0	0	0.0	0.0
May	Odo Eran	77	4	1	52.5	16.3
June	Car Wash 1	20	0	0	0.0	0.0
June	Car Wash 2	37	1	0	22.0	0.0
June	Odo Eran	70	2	2	48.2	57.4
July	Car Wash 1	24	0	0	0.0	0.0
July	Car Wash 2	42	0	0	0.0	0.0
July	Odo Eran	78	3	1	86.2	20.4
Total		908	15	12	16.27	13.45

P is significant at 0.05 NFS= Number of Female Cow Slaughtered, NFFO= Number of Female Foetus Observed, NMFO= Number of Male Foetus Observed LFFO= Length of Female Foetus Observed, LMFO= Length of Male Foetal-waste Observed.

4.3.   DISCUSSION

Out of the three abattoirs, Odo Eran significantly slaughtered more cows than car wash 1 and car wash 2 respectively. Odo Eran had the highest number of foetus wastage in the month of May (4) and July (3), however, this means that Odo Eran had more slaughtering activities. This can be attributed to the size of the abattoirs and proximity to manageable infrastructure facilities. During the research, car wash 1 had no record of slaughtering pregnant cows except in the month of May (1). On the other hand, Car wash 2 witnesses the slaughtering of pregnant cows in February and April. However, only Odo Eran witness foetal wastage throughout the research period but was highest in the month of May.

The results reveal that at least one out of every thirty-three (1:33) cows brought to the abattoirs was possibly pregnant. Of the total number of fetuses culled during the survey, approximately 55.56% percent of them were females and 44.44% percent were males. This result is in line with Adama et al. (2010) who had higher incidence of higher female foetal wastage. Of the body length, the length of the female foetuses was averagely longer than the body of the male foetus. The longest average lengths of female fetuses were recorded in the month of April (26.47), June (23.40) and July (28.70) and in respectively. Whereas the longest average length of male fetuses was recorded in the month of March (13.80), April (16.93), and June (19.13) respectively.

The length of the foetus can be used to describe the age of the pregnancy, which showed that some fetuses where observed even in the second and third trimester. However, this peculiar slaughtering were occurring more during the end of the dry season.

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27 foetuses were observed during the period of the research, while approximately one pregnant cow was slaughtered monthly across the abattoirs. The table revealed that some days had no wastage, while other where high. The highest number of wasted foetuses recovered from February to May, was in the month of April, the start of the raining season. The implication to this is that farmers where likely to take their cows to the abattoirs at the end of the dry season due to drastic shortage of food to feed their livestocks. Reproduction losses are vastly attributed as one of the crucial constraints to towards increasing cattle production, and foetuses loss as an outcome of slaughtering pregnant cows. Given the present livestock marketing setting within the area, it will be quite impossible to diagnose pregnant cows so as to avoid slaughtering the foetuses before they are calved and matured. Also, their intentions for slaughtering pregnant cows at different gestation period other than lack of technical knowhow or gross ignorance could be that livestock keepers sell pregnant cows because they appear to be larger and heavier, selling at a better price than the non-pregnant herd. Often, it is possible that many cattle keepers sell their meat for financial needs at the household and for children education.

The rise in slaughtering of cows months from February to April (Dry season), shows that the period is characterized by droughts, lack of fresh forages, which invariably exposes the animals to poor nutrition, diseases, especially those affecting the digestive system can push the keeper to slaughter the animals to avoid death or disease infection (*Abdulkadir et al. 2008; Atawalna et al. 2013*). However, the slaughtering of pregnant cows when the rains begin from May to July can be

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attributed to presence of festive ceremonies such as marriages, and traditional celebration.

Furthermore, some livestock keeping neighborhood believe that foetal meat is more nutritious than a matured cow meat, therefore increasing the demand for slaughtering pregnant cows to obtain their calves (*Swai et al. 2015*). Observation noticed from this research sternly reveals that the number of slaughtered pregnant cows and foetuses recovered where mostly in their second and third trimester which is in line with the report of Fayemi et al. (2008) who discussed that 75.7%, 74%, and 64.1% of the foetal waste collected respectively were not in their first trimester but second and third.

Whether with intentions or ignorance, the killing of pregnant cows has adverse consequences on the growth capacity of livestock herds in the country. Most importantly, the number of female waste obtained points a negative growth curve foe the opportunity to increase the future female breeding stock.

CHAPTER FIVE

5.0.   CONCLUSION AND RECOMMENDATION

5.1   Conclusion

The study revealed that 2.97% of the future productive herd is lost to these adverse practices of slaughtering pregnant cows. The higher percentage recorded can be attributed to how climate change affect farmers, adequate cattle rearing system, and lack of effective legislation against slaughtering this pregnant cows.

The study also revealed the equivalent of one out of every thirty-three cows slaughtered in the abattoirs where pregnant and most of the foetuses retrieved where in their second and third trimester. The intentions for slaughtering pregnant cows ranging from cash constraint, inadequate capacity to diagnose pregnant cows, lack of enforced animal welfare legislation, and partly ignorance. Also, poor infrastructure for holding grounds and slaughtering houses push farmers and residing abattoirs to kill these pregnant cows.

5.2   Recommendation

We strongly recommend that effective legislation and public awareness be provided to prevent the slaughtering of pregnant cows as it affects the productive herd of livestock in the community. Also, strict measures can be put in place to ensure that before any cow is slaughtered and proper routine inspection and examination be carried out on the cow to check for signs of pregnancy. Quick efforts by the government need to be provided to increase beef supply in the country so to limit the incidence of slaughtering pregnant cows.

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List of plates

Plate 1 Showing foetal wastage at first trimester observed in June 2018

Plate 2 Showing foetal wastage at the second trimesterobserved in the month of May
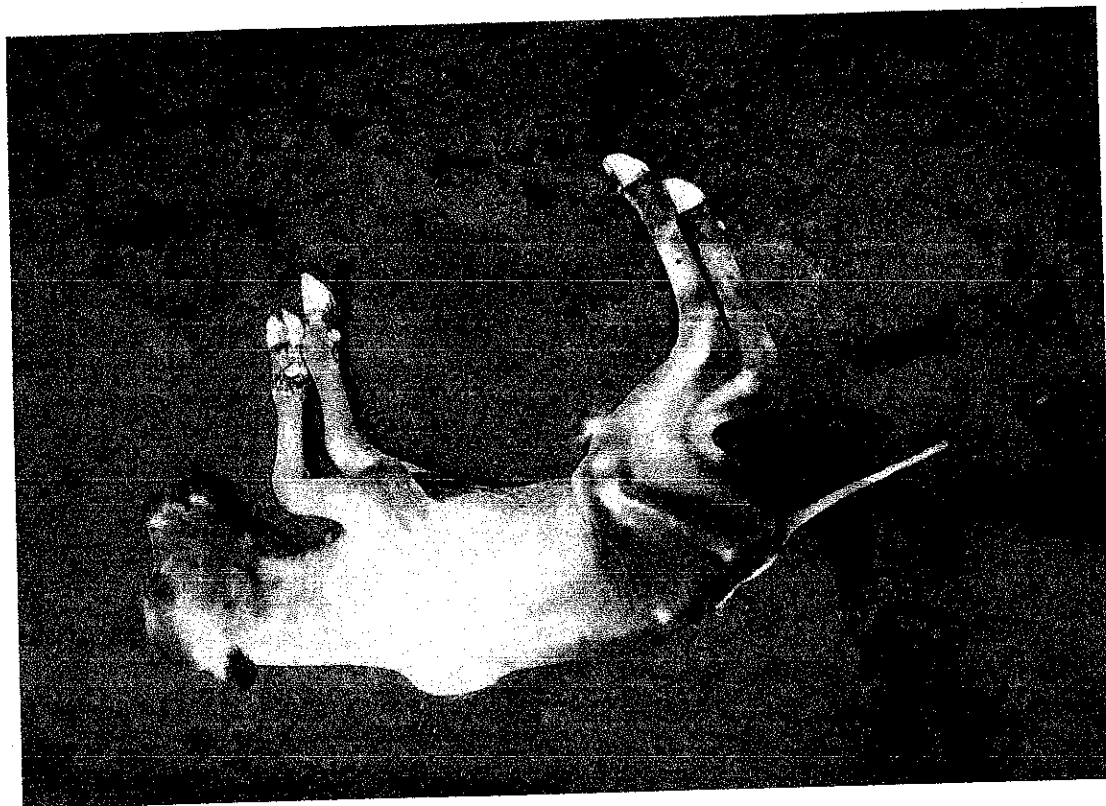

Plate 3 Showing foetal wastage at second trimester observed in April 2018

Plate 4 Showing foetal wastage at third trimester observed in February 2018.

Plate 5. Alimot taking measurement of foetus at abattoir

Appendix

MEANS AND DESCRIPTIVE STATISTICS

Abattoirs	Std. mean of NFS	NO. dev. Of NFS	Non-missing of NFS	Std. minimum of NFS	NO. maximum of NFS	Mean of NFFO	Dev. Of NFFO	Non-missing of NFFO
.	50.44444	27.70479	18	20	103	0.833333	1.248529	18
1	26.66667	4.179314	6	20	32	0	0	6
2	38.33333	4.273952	6	33	43	0.83666	6	6
3	86.33333	13.18585	6	70	103	1.414214	6	6

Minimum of NFFO	Maximum of NFFO	Std. Mean of NMFO	Number Dev. of NMFO	Non-missing of NMFO	Std. Minimum of NMFO	NumberMaximum of NMFO	Mean of LFFO	Dev. Of LFFO
0/*-	4	0.666667	0.766965	18	0	2	19.46667	11.03997
0	0	0.166667	0.408248	6	0	1	.	0
0	2	0.333333	0.516398	6	0	1	19.2	12.83121
0	4	1.5	0.547723	6	1	2	19.53333	11.1876

Non-missing of LFFO	Minimum of LFFO	Std. maximum of NFS	Number Mean of LMFO	Dev. Of LMFO	Non-missing of LMFO	Minimum of LMFO	Maximum of LMFO
15	4.7	36.1	24.01667	10.24898	12	8.4	40
.	.	19.2	1	19.2	19.2	.	.
13	5.2	30.4	25.4	17.53625	2	13	37.8
12	4.7	36.1	24.24444	10.12696	9	8.4	40

MEANS PROCEDURE FOR THE THREE ABATTOIRS IN IKOLE-EKITI, EKITI STATE.

Location	Obs	Variable	Label	N	Min	Max	Sum
Car wash1	6	NFS	NFS	6	20	32	160
		NFFO	NFFO	6	0	0	0
		NMFO	NMFO	6	0	1.0	1.0
		LFFO	LFFO	0	.	.	.
		LMFO	LMFO	1	1	19	1
Car wash2	7	NFS	NFS	6	33	43	230
		NFFO	NFFO	6	0	2.0	3.0
		NMFO	NMFO	6	0	1.0	2.0
		LFFO	LFFO	3	5.2	30	58
		LMFO	LMFO	2	13	38	51
Odo-eran	14	NFS	NFS	6	70	103	518
		NFFO	NFFO	6	0	4.0	12
		NMFO	NMFO	6	1.0	2.0	9.0
		LFFO	LFFO	12	4.7	36	234
		LMFO	LMFO	9	8.4	40	218

ANALYSIS OOF VARIANCE TABLE FOR ABATTIOR AND MONTH

SOURCE	DF	Adj SS	Adj MS	F-Value	P-Value
Months	5	489.8	97.96	1.75	0.210
Abattoirs	2	12000.4	6000.22	107.49	0.000
Error	10	558.2	55.82		
Total	17	13048.4			

TUKEY'S STUDENTIZED RANGE (HSD) TEST FOR ABATTOIR

NOTE: This test controls the Type I experimentwise error rate, but it generally has a higher Type II error rate than REGWQ.

Alpha	0.05
Error Degrees of Freedom	10
Error Mean Square	55.82222
Critical Value of Studentized Range	4.91202
Minimum Significant Difference	21.189

Means with the same letter are not significantly different

Tukey Grouping	Mean	N	Month
A	59.333	3	2
A	53.000	3	1
A	51.667	3	3
A	48.333	3	4
A	48.000	6	6
A	42.333	3	5