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Research Article

Foetal Wastage and the Future of Cattle Production in Nigeria: A Review

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Abstract

Livestock remains an essential and integral component of Nigeria's agriculture and vital to the socio-economic and food security of the country. Bovine (cattle) the most prominent ruminant animal, serves as a source of household income, food security, draft animal, transportation, revenue generation, sources of employment and integrated farming system through manure production and utilization of forages. These resources were mismanaged through indiscriminate slaughter of superior breeding stock and subsequent foetal wastages across abattoirs, which serves as a center of the practice. This practice is a threat to the national livestock herd and is widely spread at alarming rate across the country, resulting in substantial economic losses through the loss of viable foetuses, transmission of zoonotic diseases and environmental pollution. This review highlights the causes, effects and challenges associated with the slaughter of gravid bovine and subsequent foetal wastages in the country. The review estimated the slaughter of two million, four hundred and forty two thousand, fourty seven pregnant cows (2,442,047) which leads to discovery of one hundred and seventy eight thousand, seven hundred and four (178,704) foetuses. In addition, approximately ₦6,003,154,720.30 – 8,910,985,220.30 were loosed. Higher market demand, season, poor financial status, farmers' ignorance and poor infrastructural facilities contribute to this practice. Furthermore, the handling and consumption of recovered foetuses pose a significant risk of disease transmission to humans. To address this issue, strict legislation, effective surveillance, and rigid penalties for offenders are recommended. Public education and awareness campaigns are also necessary to sensitize animal producers, marketers, and consumers about the consequences of gravid bovine slaughter and foetal wastages.

Keywords: *Abattoir, bovine, foetus, pregnant, slaughter*

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Introduction

Ruminant animals are the major protein sources of animal origin for the ever teeming population of Nigeria. Cattle, being the most dominant, increased from 20.407 in 2019 to 20.585 million herd in 2020 (0.87% increase) sheep raised from 46.747 to 47.962 million (2.5% increase) and

goats from 82.714,746 to 84.039 million (1.6% increase) (National Agricultural Extension and Research Liaison Services; NAERLS, 2020). The expansion of livestock sector is far less than the human population growth. This shows a clear deficit of animal protein supply for human consumption. Despite the rapid increase in human

population that coincides with the slow growth rate of livestock sector, animal production is obstructed by many factors among which is the slaughter of pregnant animals, particularly cattle, the most prominent meat animal in the country. According to Okorie-Kanu *et al.* (2018), more than 50% of meat consumption in Nigeria is beef. This is likely due to absence of religious or ethnic taboos against its production, marketing, slaughter and consumption. The indiscriminate slaughter of gravid livestock for meat and subsequent foetal destruction is one of the deplorable practice man ever practice against his production endeavour. Reports revealed that this practice leads to decline of animal production of sub-Saharan Africa by 20 – 25% (Ngbede *et al.*, 2012). According to Ahmad *et al.* (2022), gravid bovine slaughter and foetal wastages alone depopulated Nigeria's cattle herd by 0.5% annually. Ademola (2010) stressed that, this practice is a key factor responsible for protein malnutrition in Africa and a possible constraints to future livestock population. It also frustrate the efforts of geneticist, nutritionist and breeders working towards propagation of animal species (Khan and Khan, 1989) and poses the risk of widening the gap of animal protein requirements by meat consumers. For a sound economic management, animals permitted to be slaughter for meat were males, non-reproductive females, old, accidentally injured and sterile (Khan and Khan, 1988; Opara *et al.*, 2006; Abdulkadir *et al.*, 2008). Literature revealed that a prime breeding and productive females, clinically healthy, pregnant and lactating cows were not spared for meat (Gregory and Grandon, 2007; Adama *et al.*, 2011). A reported cases of gravid bovine slaughter, fetal destruction and financial implications is presented in Table 1 while developmental stages and proportional sexes of the condemned foetuses were in Table 2. Detail discussions of the Tables were not prioritized as the reported cases presented is insignificant compared with the registered abattoirs in the country. Similarly, studies on pregnant animal slaughtered and foetal wastages in the country is based on the post-slaughter examination of uterus that relied on the presence or absence of foetuses (Alhaji *et al.*, 2017). This method is handicap as it cannot detect foetuses at early embryonic stages and thus underestimates the actual pregnancy wastages. In addition, data of animals slaughtered

out of abattoirs and those during festivals, rituals, meat shops etc were excluded. Thus, the data presented in this review is a glance and a general summary of the actual damages perpetrated in the abattoirs, as many cases are yet to be reported.

Causes of Gravid Bovine Slaughter

Higher Market Demand: this is associated with population increase and poor financial status of the farmers (Muchenji and Fayemi, 2013; Garba *et al.*, 2019) plays a significant role to this unhealthy practice. According to Muchenji and Fayemi (2013), higher market demand constituted 60% for culling and slaughter of gravid animals while farmer's ignorance and poor financial status accounted for 26.10%. Similarly, Njoga *et al.* (2021) reported that 61.3% of herders/butchers sale or slaughter their gravid cows due to high beef demands.

Season: While analyzing the effect of drought on livestock in sub-Saharan Africa, Toulmin (1986) noted that herders increased the sales of aged cows during extreme dry period and may likely to be pregnant during rainy season which may coincide with the breeding season and feed availability. Similarly, Akpabio *et al.* (2014) reported high rate slaughter of pregnant cows during peak dry season largely because farmers dispose their livestock due to body emaciation as a result feed scarcity. At this time condition, pregnancy does not manifest visibly particularly during the first trimester and early second trimester, and the farmers may be ignorant about the pregnancy status of the animals which trigger their culling and subsequent slaughter (Ngbede, 2012).

Economic hardship: Literature showed that more than 80% of the national stock was owned and managed by poor subsistence farmers, they dispose portion of their livestock to cater for their family economic hardship, procure farm inputs and pay for labour during rainy season (Alhaji, 2011; Adama *et al.*, 2011).

Other reasons/factors for the slaughter of pregnant cattle for meat includes ignorance of the pregnancy status, preference of pregnant animals due to good body condition, feed scarcity during dry season and diseases (Jajere *et al.*, 2013), festivals/ceremonies (Raimi *et al.*, 2017), poor

ante-mortem inspection (Kalu *et al.*, 2019), poor herd management (Ndi *et al.*, 1993), poor enforcement of livestock legislation (Ogunbodede *et al.*, 2016) and veterinary facilities (Zubair *et al.*, 2022).

Impact of Gravid Bovine Slaughter and Foetal Wastages

Malnutrition: Nigeria is experiencing a historic demographic expansion and a spectacular change in food habits. According to United Nation population live estimate (2024), Nigeria's population as 2024 stands at 222,017,857 which account for 2.77% of the global population and is projected to reach 377,460,000 by 2050 (Population Reference Bureau; PRB, 2021). The population of urban dwellers will triple from 94 to 280 million and the GDP/capita will also triple. These changes will exponentially raise the demand of animal products. According to Food and Agriculture Organization (FAO, 2019) beef and milk consumption alone will grow by 117% and 577% respectively. The country's own domestic production is far below in meeting its domestic requirement which forced importation of more than 25% of the beef. Literature shows that beef consumption in relation to the total cattle population is still far below the regional average (2 kg per person/per year) compared to 8 kg/caput/year in the region. Similarly, the country depends mainly on cattle for its milk production, producing 0.6 million tons, the lowest in the world, compared to 0.9 million tons in other African countries and 6.6 million tons in Asia's. The average per capita consumption is 8litres/person against World Health Organization recommendations of 210 liters/person (FAO, 2021). The current milk production capacity of the country met only 34% of the estimated 1.7 million tons annual milk consumption and the deficit (1.1 million tons) were meet by exportation costing averagely \$480.3 million (FMARD, 2021). Increased human population and high demand of meat from animals contributes largely in promoting this act (Alhaji and Odetokun, 2013). Silk obtained from condemned foetuses was noted to be consumed and considered as high quality leather material by tanneries (Mowson, 2018) and triggers the slaughter of gravid animals and subsequent foetal wastage to meet the demand of the ever increasing population. The low level of

beef and milk consumption in the country is strongly linked with malnutrition, especially among children, pregnant women and nursing mothers (Ahmad *et al.*, 2016; Odoemena *et al.*, 2020).

Disease Transmission: literature shows that naturally, diseases can be transfer from animals to human through consumption of animal products, direct contact with animals, equipment's, body fluid, body tissues, water, soil, or working closely with infected animals (Cleveland clinic, 2022). These naturally transmissible animal to human diseases are classified as a zoonosis or zoonotic disease. Example of such diseases includes leptospirosis, anthrax, toxoplasmosis, sparganosis and tuberculosis. Bakari (2016) isolated *Leptospira* bacterial species from recovered bovine foetuses in Kano central abattoir. Globally, over one million people are infected annually with leptospirosis disease and almost 600,000 die from it (Cleveland clinic, 2022).

Economic impact: according to Economic Commission for Africa (1988), on average, 17,000 pregnant cows were slaughtered annually in Nigeria leading to loosed fourteen million US dollars over a period of ten years. Similarly, Njoga *et al.*, (2021) estimated beef loss of 44,000 kg, equivalent to ₦70.1 million in south-Eastern Nigeria due to illicit slaughter of pregnant cattle. The authors further noted that only 17.6% of the recovered foetuses were utilized for human consumption, 51.80% were used for feeding swine and dogs and the remaining were either incinerated, buried or dumped in municipal waste. Raimi *et al.*, (2017) added that only 4.20% of the recovered foetuses at Lafenwa abattoir is used for human consumption, 52.0% were sold for feeding fisheries and dogs, 26.0% thrown away, 2.0% buried and 16.0% disposed through other means. If the data will be extrapolated and assumed only one registered abattoir across the 37 states including FCT, a total of 10,952 foetuses will be wasted annually, resulting in the loss of 3,256,000kg beef equivalent to ₦5,184.4 million. This losses is enormous for a country to bear. The livestock sub sector contributes only 9% of the 21% of the agricultural growth domestic product (GDP) (Federal Ministry of Agriculture and Rural Development; FMARD, 2021). The GDP

contribution to the national economy is far below the one obtainable in Africa and could be attributed to the slaughter of gravid animals and subsequent foetal wastages. The fact remains that in as much as the demand and consumption of beef is on the increase, pregnant cows will continue to be slaughtered. And if little or no effort is made towards improving cattle population in the country, then the total population figure for cattle will drastically and definitely decline. This will worsen the already precarious animal protein supplies to the teeming population. At worst, it will threaten the Nigerian livestock industry. The data (Table 1) indicated that a sum of ₦6,003,154,720.30 – 6,021,985,220.30 were lost at the time of compiling this review excluding the missing data.

Loss of Viable and Superior Breeding Stock:

Data generated during the review period, revealed a total of two million, four hundred and forty two thousand, fourty seven (2,442,047) cows were slaughtered, one hundred and seventy eight thousand, seven hundred and four foetuses (178,704) recovered (Table 1). Of the recovered foetuses, 49.50% (5,639) and 50.50% (5,752) were males and females respectively (Table 2). This clearly shows that more female foetuses were wasted and this woefully affect the national herd population and its replacement potential. It is also noted that 43.25% of the condemned foetuses were at first trimester, 33.93% at second trimesters and 22.82% at third trimesters. This indicates that majority (56.76%) of the wasted foetuses were at active developmental stages and could be better if they were born. Khaleel *et al.*, (2020) in their work reported a slaughter of 5,015,179 cows out of which 2,285,825 (45.58%) were cows and recovered 169,992 foetuses.

Loss of Genetic Resources History revealed that the rate of livestock breed extinction exceeds the rates for the production of new one (Belew *et al.*, 2016). A good conservation management of these resources are among the top priorities for sustainable development strategy (Kolosov *et al.*, 2012). The indiscriminate slaughter of pregnant animals particularly in the sub-Saharan countries is at an alarming rate (Nonga, 2015) which could further harm the livestock breed available in the country and affect the growth of the country's

livestock population. It lead to a higher inbreeding rates, inbreeding depression which had a higher breed extinction (Khaleel *et al.*, 2020). It also promotes the chance of losing the preferred traits and breeds. Among the useful tool for making decision in animal breeding is trait preference and its information (Bett and Bebe, 2017). Exotic breeds are introduced and are dominating the local one, which encourages loss of local and indigenous genetic resources (Traoré *et al.*, 2017). A number of native animals in Nigeria are under pressure, threatening their survival and existence and many were listed as endangered species. Among the endangered cattle species include Muturu, Keteku, N'dama, Kuri and Biu (Gwaza and Momoh, 2016). Despite these facts, these breeds were not spared in the abattoirs regardless of the developmental and or physiological stages of the foetuses.

Challenges: The major challenges facing Nigeria in the advancement of livestock industry is lack of modern infrastructural facilities appropriate for the management, processing and marketing of livestock resources. World health organization (1968) establishes a law that offer protection of pregnant animals from slaughter. The level of implementation of the law in Nigeria is very poor as the case of foetal wastage is raising at an alarming rate (Okorie-Kanu *et al.*, 2018; Ahmad *et al.*, 2022). It is also noted that, there is no established law at Federal and State governments (Adama *et al.*, 2011), local government or community to checkmate slaughter of pregnant animals. This makes it difficult and challenging to control the actors involved in exercise, as lack of these laws is like indirect legalization of the practice. The majority of registered abattoirs in the country were either owned by individuals, states or local governments. Most of the states (Khaleel *et al.*, 2020) and local governments partner meat inspection activities with private individuals whose priority is revenue generation, neglecting the animal welfare, personnel safety and meat quality. In addition, the abattoirs were local for a reasonable post-mortem inspections, which promote the slaughter of gravid bovine and foetal destruction. Nigeria is among the leading cattle producer in the sub-Saharan Africa, hosting over 18.2 – 22.0 million herd and more than 99% of these animals are under traditional pastoral

systems (FMARD, 2021). These group of livestock rearers had poor access to modern facilities and technological innovations on livestock management. They also depend on natural pastures to feed the animals and had no permanent settlement which makes it difficult to reach and enlighten regarding the advancement on livestock management. The frequent farmer-pastoralists conflicts and cattle rustling results in depletion of national herd and creates fear and loss of sources of livelihood to many Nigerians who depend directly or indirectly on animal agriculture for their sustenance. This widen the gap between production and consumption of meat and milk.

Prospects Nigeria's had a conducive atmosphere supporting production of wide array of livestock which make it among the top animal producer in the sub-Saharan Africa. The livestock sector is an essential and integral component of country's agriculture and a vital to both the socio-economic and food security, providing employment, food, farm energy, manure, fuel, transport and revenue. The conservation of these natural resources is a challenging aspect demanding higher priority. The slaughter of gravid bovine is unethical, unhealthy and unprofitable, as it leads to loss of primed reproductive cows and viable fetuses. This practice further threatens the future of the national cattle herd population. Governments at all level should establish and ensure strict compliance of laws to prohibit the slaughter and or sales of gravid animals especially bovine, in addition to international meat act and ensure violators are punished, as the reported cases were at alarming rate. Animal producers, marketers, abattoirs workers, other stakeholders and the general public should be sensitized periodically regarding the consequential effects of the slaughter of pregnant animals and associated risk of handling and or consumption of recovered fetuses. Abattoirs across the country should be equipped with up to date facilities, testing kits and scanners for prompt pregnancy detection and the positively tested animals should seized and keep under government custody and the owners compensated or return to them after parturition.

Conclusion

The incidence of calf foetal condemnations as a result of slaughtering pregnant animals in Nigerian abattoirs is rampant and is alarming. This poses substantial economic losses and transmission of zoonotic diseases to abattoir workers and those involves in handling and consumption of the recovered fetuses. It also leads to losing of productive females animals which would have effectively provides offspring for replacement and maintaining the herd. For Nigeria's future demands on beef supplies and bovine genetic resource conservation, it is necessary to checkmate the occurrence of the slaughter of gravid cows and calf foetal wastages. This can be achieved by enactment and enforcement of strict legislation and ensuring effective surveillance at the slaughter slabs and imposing rigid penalties to the principal actors. The effective implementation of these regulations together with proper monitoring and recording of pregnancy at livestock control points and abattoirs, will limit such unhealthy acts.

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Table 1. Bovine Foetal Wastages and its Economic Implication in some Nigerian Abattoirs

State / Abattoir	NCS	NFR	EEL (₦)	References
Ebonyi – Abakaliki, Afikpo and Onueke	4,690 (47.96%)	429 (9.15%)	*	Nwakpu and Osakwe (2007)
Lagos – Oko-Oba	392,062 (33.50%)	7,406 (1.80%)	*	Ademola, (2010)
Kogi – Lokoja, Dekina, Okenne, Kabba, Ijumu and Ankpa	22,002 (37.46%)	1,007	*	Daikwo et al, (2010)
Niger – Minna,	3,106 (62%)	120 (3.86%)	*	Adama et al, (2011)
Kaduna – Kaduna metropolis	*	4,892	28,390,833.30 - 40,558,333.30	Ngbede et al, (2012)
Ogun – Lafenwa municipal	11,591 (76.70%)	1,617 (13.95%)	*	Oduguwa et al, (2013)
	39,776 (79.05%)	4,115 (10.35%)	2,766,432,528.0	Awoyomi et al, (2013)
Akwa-Ibom – Abak	1,620 (34.50%)	349 (21.54%)	29,665,000.00	Uduak and Samuel, (2014)
Borno – Maiduguri	4,453 (51.98%)	1,336 (30%)	11,502,960.00	Iliyasu et al, 2015
Borno – Maiduguri metropolitan	188 (33.5%)	28 (15%)	3,780,000.00	Mshelia et al, (2015)
Benue – Wurukam	644 (43.8%)	66 (10.25%)	518,500.00	Odeh et al, (2015)
Niger – Minna metropolitan	130,958 (50.20%)	5,929 (4.53%)	*	Alhaji et al, 2015
Oyo – Bodija central	28,067 (39.04%)	10,078 (35.97%)	*	Ogunbodede and Oladele, (2016)
	52,080 (57.22%)	13,563 (2.60%)	*	Bakari, (2016)
Kano – Kano central	10,769 (5.2%)	561(5.20%)	6,732,000.00 to 8,415,000.00	
Benue – Makurdi	247 (58.25%)	6 (2.43%)	420,000.00 to 600,000.00	Adeyemi et al, (2016)
Ogun – Lafenwa	11,790 (76.7%)	1,262 (10.7%)	*	Raimi et al, (2017)
Plateau – Jos	26,248	1,346 (4.5%)	174,980,000.00	Dunka et al, (2017)

Table 1. Continuation

Abattoir /State	NCS	NRF	EEL (₦)	References
Niger – Minna, Suleja, Bida, Kontagora and New Bussa	1,132,070 (53.34%)	52,234 (4.61%)	1,731,557,200.00	Alhaji et al, (2017)
Abuja – Gwagwalada	348 (20.67%)	101 (29.02%)	9,090,000.00	Obudu et al, (2018)
Sokoto – Sokoto Modern	72(19.19%)	32 (8.90 %)	*	Abubakar et al, (2019)
Adamawa – Mubi main abattoir	1,338 (61.29%)	633 (47.31%)	*	Danladi et al, (2019)
Ogun – Oja-tuntun	3,421 (28.7%)	244 (7.13%)	25,254,000.00	Anyaku et al, (2019)
Abia – Ubakala	588 (32%)	72 (12.2%)	*	Kalu et al, (2019)
Kebbi – Birnin Kebbi	225 (5.68%)	15 (6.67%)	189,224,500.00	Garba et al, (2019)
Bauchi – Bauchi	93(18.0%)	22 23.66%)	*	Sule et al, (2020)
Sokoto – Sokoto modern	749 (53.27%)	24 (3.20%)	*	Sanusi et al, (2020)
Ogun – Lafenwa	353,503 (83.33%)	44,713 (12.65%)	1,142,640,000.00	Adebowale, (2020)
Enugu – Nsukka, Awka and Enugu	851(44.07%)	148 (17.39%)	70,100,000.00	Njoga et al, (2021)
Taraba – Jalingo	2,143 (53.91%)	162 (7.56%)	11,400,000.00 to 16,200,000.00	Usman et al, (2021)
Kebbi – Rafin Zuru and Rikoto	67 (69.07%)	32 (47.76%)	*	Sakaba et al, (2021)
Kano – Kano Central	7,722 (64.73%)	232 (3.00%)	3,944,000.00	Ahmad et al, (2022)
Jigawa – Hadejia	21,781 (63.74%)	3,763 (17.29%)	2,162,160,000.	Zubair et al, (2022)
Sokoto – Sokoto modern	361	72 (19.94%)	16,416,499.00	Abubakar et al, (2023)
Kaduna – Kaduna South, Sabon Gari and Jema'a	70,180 (42.03%)	7,341 (10.49%)	*	Gugong et al, (2023)
Borno – Maiduguri	79,588	10,137 (12.74%)	2,889,000,000.00	Jajere et al, (2023)
Taraba – Jalingo	141,607 (86.5%)	17,220 (12.2%)	*	Uko et al, (2024)
Total	2,442,047	178,704	6,003,154,720.30 – 8,910,985,220.30	

NCS = number of cows slaughtered, NRF = number of fetuses recovered,

EEL (₦) = Estimated economic losses, * = missing data

Table 2. Sex and Developmental Stages of Recovered Bovine Foetuses in some Nigerian Abattoirs

State/Abattoir	MFR	FFR	Pregnancy stage (Trimesters)			Reference
			1 st	2 nd	3 rd	
Niger – Minna	68 (56.70%)	52 (43.30%)	*	*	*	Adama et al, (2011)
Kaduna – Kaduna metropolis	*	*	2980 (60.92%)	1431 (29.25%)	481 (9.83%)	Ngbede et al, (2012)
Ogun – Lafenwa municipal	*	*	564 (34.80%)	565 (34.90%)	491 (30.30%)	Oduguwa et al, (2013)
Ogun – Lafenwa municipal	*	*	2,540 (61.70%)	1575 (38.30%)		Awoyomi et al, (2013)
Maiduguri – Borno	*	*	32 (2.39%)	696 (52.10%)	608 (45.51%)	Iliyasu et al, (2015)
Benue – Wurukam	33 (50.00%)	33 (50.00%)	35 (53.03%)	30 (45.45%)	1 (1.52%)	Odeh et al, (2015)
Borno – Maiduguri metropolitan	15 (53.75%)	13 (46.23%)	5 (17.86%)	10 (35.71%)	13 (46.43%)	Mshelia et al, (2015)
Oyo – Bodija central	4976 (49.37%)	5102 (50.63%)	2816 (27.94%)	4116 (40.84%)	3146 (31.22%)	Ogunbodede and Oladele (2016)
Kano – Kano central	*	*	116 (20.70%)	315 (56.30%)	129 (23.00%)	Bakari (2016)
Benue – Makurdi	4 (66.67%)	2 (33.33%)	0.00	1 (16.67%)	5 (83.33%)	Adeyemi et al, (2016)
Niger – Minna, Suleja, Bida, Kontagora and New Bussa	*	*	24,007 (46.00%)	17,236 (33.00%)	10,991 (21.00%)	Alhaji et al, (2017)
Sokoto – Sokoto Modern	*	*	5 (15.63%)	22 (68.74%)	5 (15.63%)	Abubakar et al, (2019)

MFR = male foetus recovered, FFR = female foetus recovered, * = missing data

Table 2. Continuation

State/Abattoir	MFR	FFR	Pregnancy stage (Trimesters)			Reference
			1 st	2 nd	3 rd	
Adamawa – Mubi main abattoir	294 (46.45%)	339 (53.55%)	*	*	*	Danladi et al, (2019)
Abia – Ubakala	38 (52.78%)	34 (47.22)	29 (40.28%)	19 (26.39%)	24 (33.33%)	Kalu et al, (2019)
Bauchi – Bauchi	15 (68.18%)	7 (31.82%)	8 (36.36%)	9 (40.91%)	5 (22.73%)	Sule et al, (2020)
Sokoto – Sokoto modern	6 (25.00%)	18 (75.00%)	3 (12.50%)	21 (87.50%)	0.00	Sanusi et al, (2020)
Enugu – Enugu, Nsukka and Awka	82 (55.41%)	66 (44.59%)	33 (22.30%)	51 (34.50%)	64 (43.20%)	Njoga et al, (2021)
Taraba – Jalingo	98 (60.49%)	64 (39.51%)	59 (36.42%)	51 (31.50%)	47 (29.00%)	Usman et al, (2021)
Kebbi –Rafin Zuru and Rikoto	10 (31.25%)	22 (68.75%)	*	*	*	Sakaba et al, (2021)
Total	5,639	5,752	33,323	26,148	17,585	
Percentage (%)	49.50	50.50	43.25	33.93	22.82	

MFR = male foetus recovered, FFR = female foetus recovered, * = missing data