

Constraint to use Modern animal processing technologies in Amosun Abattoir Akinyele Local Government Area of Oyo State

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ABSTRACT

Herbal medicine has a long history of being for treating various ailments ranging in severity. Traditional medicine is widely used on a regular basis by Sudanese. This research aims to determine the phytochemical constituents and evaluate the antioxidant and antimicrobial activities of the crude extracts from three Sudanese traditional medicinal plants (khella, marula and black mustard). The phytochemicals of the oils were determined by Gas Chromatography Mass Spectrometry (GC-MS). The GC-MS analysis showed that the predominant constituents in the black mustard were 2,4-Decadienal (31.72%), 2-Pyrrolidinone 1-methyl (19.41), phenol (9.43%), Limonene (6.8%), Benzoic acid (2.12%), 2-(1-phenylethyl)- (1.78%), and Eugenol (0.96%). The identified fatty acids were Oleic acid (1.86%) and Palmitic acid (1.34%). The major aromatic components found in the marula extract were Phenol, 2,2'-methylenebis[6-(1,1-dimethylethyl)-4-methyl(29.96%), Phenol, 2,4-bis(1,1-dimethylethyl)(1.94%). The major fatty acid present was Linoleic acid (18.51%). The most abundant components found in the khella seed oil were α -Farnesene (11.8%), Ammidin (5.44%), Methoxsalen (3.62%), Stearic acid (2.81%), Palmitic acid (2.81%), Decanoic acid, propyl ester (1.10%) and Oleic acid (0.81%). To assess the antioxidant activity of the three aqueous extracts, the radical scavenging activity (RSA %) for khella seed extract varied between 21.15 and 75.44 for all concentrations (125, 250, 500, 1000 μ g/ml). At a concentration of 1000 μ g/ml, black mustard extract scavenged 46.65% of DPPH radicals, whereas that of 500, 250 and 125 μ g/ml caused 28.31%, 20.68%, and 19.38% RSA, respectively. The aqueous extract of marula bark had the highest RSA for all concentrations (98.67%, 97.06%, 95.76%, and 80.84%, respectively) compared to the aqueous seed extract of khella and mustard. Antimicrobial activities of different solvents extract of the three medicinal plants studied against three selected microorganisms (*E. coli*, *S. Aureus* and *C. albicans*). Ethanolic extract of marula and khella showed the most potent activity against *S.aureus* and *C. albicans*. Aqueous and chloroform extracts were failed to inhibit growth for the three strains. The MIC concentrations ranged from 0.37mg/ml to 0.75 mg/ml for both bacteria and fungi.

Keywords: Medicinal plants, phytochemical constituents. Antimicrobial, Antioxidant

INTRODUCTION:

Although, the information on the number of livestock animals that are reared in each of the system could not be accessed, predominantly among small scale farmers is the extensive system and it is also called the free range system. In Nigeria, cattle are reared primarily for meat which is a veritable source of protein for human and for milk such as found with government aided industries like Kano dairy farm noted for large scale production for milk, yoghurt etc. in the 80s, hides and skins, bones hooves etc. all of which serves as raw materials for some agro allied industries. These industries serve as income and employment opportunities for the people wherever they exist.

In recent years, there is increased global consumption of meat, poultry and dairy products. It is estimated that per capital consumption in developing countries of livestock products could rise by as much as 40% by 2030 [1]. Income, population movements, education, preferences and lifestyles are critical factors affecting dietary patterns. Throughout the world, there is currently major shift from consumption of basic staple diets towards more diversified diets with milk and other livestock products, fruits vegetables and processed foods are on increasing demand [2]. Meat is defined as the freshly dressed or processed tissues, mainly skeletal muscles from warm-blooded animals suitable for use for food [3]. Meat is a good source of essential nutrients required for growth and development, and one of the most important sources of high quality protein, vitamins and mineral [4].

An abattoir is defined as a special facility designed and licensed for receiving, holding, slaughtering and inspecting meat animals and meat products before release to the public for consumption [5]. In modern meat procedures, most of the processing steps are usually mechanized. The meat machines are designed for long lasting, high functionality, simple cleaning, highest hygiene, safety and easily operation. Modern machines includes top quality likes knives, clippers, blades, shears, hand saws and some others mechanical equipment that are designed to give the best productivity for beef, goat, lamb slaughter and other eating animals [6].

However, the processing of animal meat in Nigeria is generally by traditional method, animals are slaughtered on floors outside the abattoir facility by butchers whose knowledge about hygiene is poor. It is against this background that the study is to investigate the constraints to use modern animal processing technologies in the study area.

Specific objectives

The specific objectives of this study include to:

- Identify socio-economic characteristics of respondents in the study area.
- Describe availability of modern animal processing technologies among respondents in the study area.
- Determine constraints militating against the utilization of respondents of the modern animal processing technologies in the study area

Hypothesis of the study

The hypothesis stated in the null form is tested:

H₀₁: there is no significant relationship between constraint and utilization of modern animal processing technologies among respondents in the study area.

MATERIALS AND METHODS

The study was carried out in Akinyele Local Government area of Oyo State. Akinyele is one of the eleven Local Government that make up Ibadan metropolis with its headquarters area at Moniya. It created in 1976 and shares boundaries with Afijio Local Government to the North, Lagelu Local Government area to East, Ido Local Government area to the West and Ibadan North Local Government area to the South, It occupies a land area of 464,892 square kilometers with a population density of 516 persons per square kilometer. Using 3.2% growth rate from 2006 census figures, the 2010 estimated population for the Local Government is 239,745 people [7].

Sampling Procedure and Sample size

Multi-stage sampling techniques were used for this study. First stage is Purposive sampling of Identification of cattle butchers Second stage is the random selection of butchers using modern technology working in the abattoir. Third stage is the random selection of 53.5% butchers to give a total of 112 respondents used for the study.

RESULTS AND DISCUSSION

Table 1: Socio-economic characteristics of the respondents

| Variables | Frequency | Percentage (%) |
|----------------------------------|-----------|----------------|
| Sex | | |
| Male | 111 | 100.0 |
| Female | 0 | 0 |
| Age | | |
| 20 – 29 | 20 | 18.02 |
| 30 – 39 | 36 | 32.43 |
| 40 – 49 | 35 | 31.53 |
| 50 – 59 | 17 | 15.32 |
| 60 and above | 3 | 2.70 |
| Marital status | | |
| Single | 9 | 8.10 |
| Married | 100 | 90.10 |
| Divorced | 2 | 1.80 |
| Education background | | |
| No Formal education | 18 | 16.20 |
| Primary education | 50 | 45.00 |
| Secondary education | 35 | 31.50 |
| Tertiary education | 8 | 7.20 |
| Tribe | | |
| Yoruba | 108 | 97.30 |
| Igbo | 3 | 2.70 |
| Hausa | 0 | 0 |
| Religion | | |
| Christianity | 27 | 24.30 |
| Islam | 84 | 75.70 |
| Membership of Association | | |
| Yes | 108 | 97.30 |
| No | 3 | 2.70 |
| Total | 111 | 100.0 |

Source: computed from researcher's survey data

The results show that majority (100%) of respondents were male who engaged in animal slaughtering in the abattoir, 90.1% were married with 32.43% of age range 30-39 years and 45% had their primary school leaving certificate as their level of education background in the study area. This implies that majority of the respondents are mature, which in support of findings by Akinbile [8] who reported that marriage confers responsibility and send signal that they are mature and versatile even responsible. Also the result is in tandem with Oladele [9] who stated that exposure of people to education will increased their ability to adopt changes. The result further revealed that majority 95.7% of respondents were Yoruba's and few were Igbo's. This indicated that Yoruba's dominated the study area as it falls in south west region of Nigeria. Furthermore, the result shows that majority 75.7% of respondents were practicing Islam while 24.3% were practicing Christianity as their Religion in the study area, with 97.3% of respondents belongs to association while 2.3% does not belong to any association in the study area. The implication is that majority of respondents share a common goal/ ideas in the study area.

Table 2: Availability of Modern animal Processing technologies in the study area

| Modern Animal Processing technologies | Available (f) (%) | Not Available (f) (%) |
|---------------------------------------|-------------------|-----------------------|
| Stunning machine | 111 (100.0) | 0 |
| Bleeding machine | 111 (100.0) | 0 |
| Effluent management | 111 (100.0) | 0 |
| Skinning machine | 111 (100.0) | 0 |
| Evisceration and viscera inspection | 111 (100.0) | 0 |
| Splitting machine | 111 (100.0) | 0 |
| Solid waste | 111 (100.0) | 0 |
| Transportation | 111 (100.0) | 0 |
| Market | 107 (96.4) | 4 (3.6) |
| Laboratory | 26 (23.4) | 85 (76.6) |

| | | |
|-------------------|-------------|---|
| Security | 111 (100.0) | 0 |
| Lairage | 111 (100.0) | 0 |
| Cold room | 111 (100.0) | 0 |
| Washing equipment | 111 (100.0) | 0 |

Source: computed from researcher's survey data

Result of analysis in table 2 also revealed that availability of modern animal processing technologies were 100% ranging from Stunning machine, Bleeding machine, Effluent management, Skinning machine, Evisceration and viscera inspection, Splitting machine, Solid waste, Transportation, Security, Lairage, Cold room and Washing equipment in the study area. The implication is that almost modern animal processing technologies were available in the study area.

Table 3: Constraints to use Modern animal processing technologies in the study area

| Constraints | Severe Constraints | Mild Constraints | Not a Constraints |
|--|--------------------|------------------|-------------------|
| Illiteracy | 79 (71.2) | 31 (27.9) | 1 (0.9) |
| High cost of modern processing | 35 (31.5) | 48 (43.2) | 28 (25.2) |
| Unfavorable Government Policy | 34 (30.6) | 52 (46.8) | 25 (22.5) |
| Lack of adequate technical know-how | 5 (4.5) | 19 (17.1) | 87 (78.4) |
| Fluctuation of electricity | 13 (11.7) | | |
| Inadequate of Veterinary personnel | 1 (0.9) | 8 (7.2) | 102 (91.9) |
| Religion barrier | 16 (14.4) | 76 (68.5) | 19 (17.1) |
| Culture barrier | 6 (5.4) | 98 (88.3) | 7 (6.3) |
| Lack of adequate information on modern processing technologies | 1 (0.9) | 23 (20.7) | 87 (78.4) |
| Inadequate transportation from the abattoir site to market in the city | 13 (11.7) | 86 (77.5) | 12 (10.8) |
| Inadequate waste management | 3 (2.7) | 7 (6.3) | 101 (91.0) |
| Lack of adequate of standard animal processing | 1 (0.9) | 3 (2.7) | 107 (96.4) |

Source: computed from researcher's survey data

Result of analysis in table 3 revealed that 71.2% of the respondents had illiteracy as severe constraint while 88.3% of respondents had Culture barrier, 77.5% had inadequate transportation from the abattoir site to market in the city, 68.5% had Religious barrier and 62.2% had fluctuation of electricity as mild constraints in the study area. While 96.4% had Lack of adequate of standard animal processing, 91.9% had Inadequate of Veterinary personnel, 91.0% had Inadequate waste management, 78.4% had Lack of adequate information on modern processing technologies and 78.4% had Lack of adequate technical know-how as not a constraints in the study area.

Table 4: PPMC showing the relationship between constraint and utilization of modern animal processing technologies among respondents in the study area.

| Variables | PPMC | p-value | Decision |
|----------------------------|-------|---------|----------|
| Constraints VS Utilization | 0.456 | 0.000 | S |

The result of analysis in table 4 revealed that there is a negatively inverse significant relationship between constraints and utilization of modern animal processing technologies among butchers in the study area. The implication of this is that the higher the constraints to use the modern animal processing technologies the lower the utilization among butchers in the study area. Conversely, the less the constraints to used of modern animal processing technologies, the higher the utilization of modern animal processing technologies among butchers in the study area. Constraint is a significant and fair factors in effecting changes in butchers' utilization of modern animal processing technologies.

CONCLUSION AND RECOMMENDATIONS

The study investigates the constraints to use modern animal processing technologies in the study area. Results showed that majority of the respondents were male with larger part married and had primary education as their educational background and member of their association.

Result also revealed that availability of modern animal processing technologies ranging from Stunning machine,

Bleeding machine, Effluent management, Skinning machine, Evisceration and viscera inspection, Splitting machine, Solid waste, Transportation, Security, Lairage, Cold room and Washing equipment in the study area. Result further revealed that majority of respondents had illiteracy as severe constraint while Culture barrier, inadequate transportation from the abattoir site to market in the city, Religious barrier and fluctuation of electricity as mild constraints in the study area. The result of analysis revealed that there is a negatively inverse significant relationship between constraints and utilization of modern animal processing technologies among butchers in the study area.

Based on empirical findings of the study, the following recommendations were put forward; Government should enact laws and regulations that will make non-compliance with utilization of modern animal processing technologies a punishable offence and also provide more inspecting agents to carry out complete and proper meat inspection in order to facilitate the use of modern animal processing technologies among butchers in the study area.

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