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RESEARCH ARTICLE

CHARACTERIZATION OF PIG PRODUCTION SYSTEMS IN EMBU WEST SUB COUNTY, EMBU COUNTY, KENYA.

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Abstract

A survey to characterize pig production systems was carried out among pig farmers in Embu West Sub County in Kenya. Data was collected through observations, photography and structured questionnaires administered to 104 pig rearing households. Majority (63.3%) kept between 1 to 4 pigs. About 85% utilised family labour with 70% of the households having between 2 to 5 members. Large White was the main breed type (65.4%). Breeding stock was mainly sourced locally from other farmers (95.2%). All farmers practiced intensive mixed production system. Main production challenges were lack of high quality breeding stock (95.2%), feeding (95%), housing (88%) and diseases and pests (84%). Majority (92.3%) slaughtered and sold pork locally. About 40.4% and 10.6% of the pig farmers were members to Saccos and table banking groups respectively. Other livestock kept include; poultry, mostly free range (97.1%), cattle, mainly for dairy (93.3%), shoats (16.3%) and fish (1.0%).

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Introduction:-

Food security remains a major global challenge as the world population continues to increase. Population growth, urbanization, income growth, and changes in diets of people are predicted to fuel massive demand for food of animal origin (FAO, 2006). White meat, which includes poultry and pig meat, is increasingly being accepted in Kenya (Bett *et al.*, 2012), and trends in the consumption of white meat are on the increase. Pig production in Kenya is relatively well developed (FAO, 2012).

The study area has an estimated population of 2,000 pigs. In 2013, 792 pigs were slaughtered and consumed there, 1,250 were moved out to Farmer's Choice company for slaughter and 567 moved to other destinations for both breeding and slaughter purpose (Embu West, Sub County Veterinary Office Annual Report, 2013). It is on this background this study intends to characterize pig production systems in the study area.

Literature Review:-

Pig production systems of the world are diverse; those in the developing countries are classified into extensive (traditional, semi-intensive and intensive) pig farming systems (Verhulst, 1990). Extensive and semi-intensive production systems supply mainly the rural populations while the intensive sector supplies the urban centers.

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The intensive production sector is constrained by high financial investments, access to credit, health problems, lack of technical expertise and qualified personnel, insufficient and inadequate local resources, foreign currency problems (for importing certain feed ingredients, medicines and equipment) (Verhulst, 1990).

Some studies have concluded that intensive pig production should not be recommended for developing countries particularly Africa and special attention ought to be given to the development of extensive pig farming (Lekule and Kyvsgaard, 2003).

Many pig farmers still allow pigs to forage on pasture and supplement with available farm waste (Rangoma, 2013). Most households have kitchen wastes, which can be used on pig; however, this is only for partial feeding of one pig per household. Other locally available feedstuffs like maize and sorghum are deficient in lysine and methionine, the most limiting amino acids in pig feeds. In intensive production systems, nutrients must be provided by the farmer (Lekule and Kyvsgaard, 2003).

In addition to daily nutrient required by the pig for maintenance, growth and reproduction, other pig nutrients requirements depend on the size and the physiological state. Formulating a feed ration is a complex procedure which any farmer might not be able to perform. It is only prudent for pig farmers to purchase already prepared rations from reliable commercial sources (Rangoma, 2013). Leaves from shrubs such as cassava and mulberry, from vegetables such as sweet potato and cocoyam, together with water plants such as duckweed and water spinach can successfully be used in diets for pigs to replace at least the protein usually supplied as soybean and fishmeal (Preston, 2006).

The pig production systems practiced in Kenya are; scavenging or backyard production, traditional free range system, small scale intensive production and commercial pig farms (FAO, 2012; The Kenya Meat Sector Report, 2014). The Large White is the main breed kept due to its desirable growth potential and high fecundity (Wanjaiya, 1999; Githinji *et al.*, 2007).

The free-range system is characterized by high mortality rates, low off take, low reproductive rates, minimal health care or supplementary feeding, lack of proper housing and high levels of inbreeding (FAO, 2012).

The intensive pig production systems are the commercial method of pig production under which economic considerations are the sole determinant of herd size. It involves the farmer growing or buying feeds, proper housing with adequate shade, pen space. Feed and water facilities are provided to meet requirements of pigs at various stages. High performance breeds or their crosses are used. Access to credit facilities is possible. Intensive pig production may be small, medium or large (FAO, 2012). This study was aimed at establishing the type of production systems in the study area.

Methodology:-

A descriptive survey research design was used. A sample of 104 respondents was obtained from a target of 142 households by simple random sampling according to Yamane (1967:886). Data was collected through observations, physical inspection of households, photography and using structured questionnaires. These were then analyzed using Statistical Package for Social Sciences (SPSS). Descriptive statistics including frequency counts, means and percentages were used to analyze the data. The results of the data were presented in frequency tables and charts.

Results and Discussion:-

The characteristics of households keeping pigs are presented in Table 1.

Table 1:- Socio-economic characteristics of households

Descriptors	Percentage
Gender of respondents	
Male	96.2
Female	3.8
Family head	
Male headed	93.3
Female headed	6.7
Child headed < 18 years	0

Educational level of family head	
Primary level	59.6
Secondary level	38.5
Tertiary level	1.9
Informal	0
Religion/Sect	
Catholic	18.3
Protestant	81.7
Islam	0
Farm Size in acres of households	
0.25-2.0	47.2
2.25-4.0	31.7
4.24-7.0	19.2
>12	1.9
Those involved in farming activities	
Parents only	8.7
Both parents and children	85.5
Children	0
Hired Workers	5.8

Most (96.2%) of the pig farmers were males depicting gender disparity in pig ownership. This differs with other studies where rural pig farming is mainly done by women and girls (Nsoso *et al.*, 2006; Chiduwa *et al.*, 2008; Kamuribo *et al.*, 2011; Petrus *et al.*, 2011; Halimani *et al.*, 2012). Like in Zimbabwe and Botswana, Nsoso *et al.*, (2006) reported that 75% of female and 69.7% of girls were involved with pig husbandry.

In the study area, the age range of pig farmers was 31-70 years with a mean age of 49 years. Nsoso *et al.*, (2006) found that 62.5% of respondents in Botswana who kept pigs were over 41 years old. In Tanzania those who kept pigs had a mean age of 38 years (Kamuribo *et al.*, 2011).

Land sizes owned ranged from 0.25 – 25 acres with a mean land size of 2.9 acres. Over 60% of the households kept between 1-4 pigs. In India where many farmers have less than 2 acres of land (Kumaresan *et al.*, 2009), and in Bangladesh where 52.8% of pig owners are landless (Hossain *et al.*, 2011) farmers have successfully reared many pigs under intensive production systems.

Pigs were reared under a mixed farming system involving crops, other livestock and poultry. This can be explained by the fact that resource poor people should not derive their income or food security from a single source; they need a number of safety nets or livelihood diversifications (Dietze, 2011). These farmers are considered as smallholder often characterized by intensive labour, few acres of land, diversified production systems using crop and other livestock species (Waters-Bayer and Bayer, 1992). This is in addition to limited access to capital, equipment and feed supplies (Lukefahr and Preston, 1999).

The family size ranged from 2 – 8 persons with 70% of the households composed of 2-5 persons. Family labour constituted (86.5%) with hired labour constituting only 5.8%. Utilization of family labour is regarded as one of the key investments for family farms (Barlett, 1980). This also provides additional employment opportunities for the farm family (Dietze, 2011; Deka *et al.*, 2007).

All the household heads had attended school with 59.6 % having primary level of education, the rest had secondary and post secondary levels of education. This indicates that all the household heads can easily adopt new technologies. There was significant positive correlation ($p=0.01$, $r=0.335$) between the level of education of household heads and the application of supplemental iron to piglets. This agrees with Nyangito (1986) who notes that adoption of new improved technologies in agriculture is positively correlated to education.

The study area had 40.4 % post primary education. This is in comparison to Nsoso *et al.* (2006) in Botswana that 25% of respondents had secondary education; Kamuribo *et al.* (2011) in Tanzania that only 14% had secondary

education. In Bangladesh, Hossain *et al.* (2011) found that only 20.8% of pig farmers had post-primary education. All the respondents in this study were Christians comprising of Protestants (81.7%) and Catholics (18.3%).

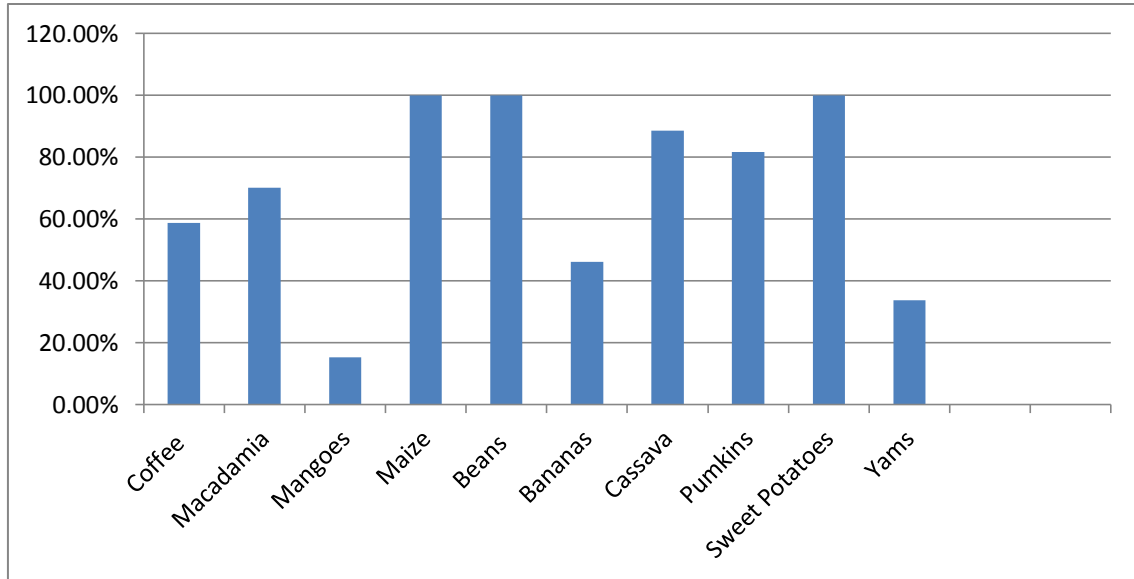


Fig 1:- Other crops grown in the study area

Cash crops grown include Coffee (58%), Macadamia (70.2%), and Mangoes (15.4%). Food crops like maize and beans were grown by all the farmers. Other crops grown were bananas (46.2%), traditional crops such as cassava (88.5%), pumpkins (81.7%), sweet potatoes (100%) and yams (33.7%). Some traditional food crops and their by-products were also used as pig feeds.

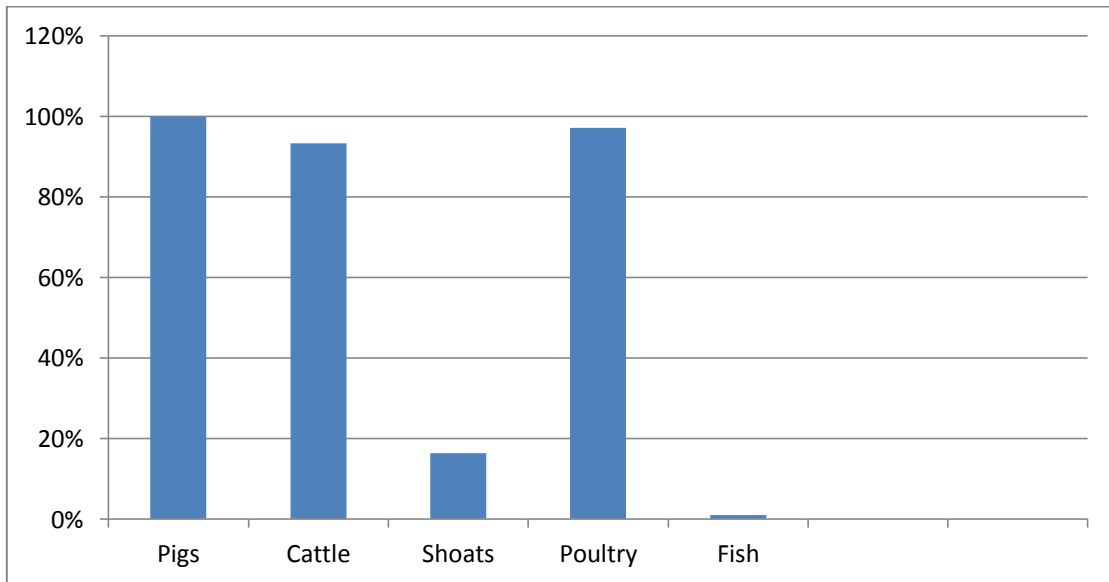


Fig 2:- other livestock kept in the study area

Other animals kept were: poultry, mostly under free range (97.1%), cattle, mainly for dairy (93.3%), shoats (16.3%) and fish (1.0%). Pigs were competing with poultry for the available feed resources like leftovers. The study concluded that pigs were kept under intensive systems under integrated crop-livestock production systems. Table 2 presents pig production and management practices in study area.

Table 2:- Pig Production and Management Systems in Embu west sub-county.

Variables	Percentage
Breeds of pigs kept by households	
Large White	51.9
Landrace	33.7
Both Large White and Landrace	14.4
Source of breeding stock	
Locally from other farmers within the sub county	95.2
Farmers Choice	4.8
Breeds valued most	
Large White	65.4
Landrace	34.6
Production systems practiced by households	
Intensive production system	100
Routine husbandry practices on piglets	
Administering Iron injection/ paste	16
Clipping teeth of piglets	12
Castration	100
Tail docking	0
Households with disease/pest management problems	83.7
Households with problems feeding their pigs	95.2
Households with problems housing their pigs	87.5

Main pig breeds were large white (52%) and land race (34%). The most preferred pig breed was large white by 65% of the farmers. It was preferred because; it's prolific (64.4%), local availability (45.2%), fast growth rate (32.7%) and good mothering ability (25%).

It has been noted that a high percentage (95.2%) of replacement stock for breeding were purchased locally. This agrees with other studies by Kagira *et al.*, (2010) and Madzimure *et al.*, (2013). This predisposes to inbreeding and subsequently low production, reproduction and poor health. When available, good breeding stock was expensive to most of the smallholder pig farmers. Lack of good quality breeding stock been reported by other studies in Kenya (Mutua, 2010; FAO, 2012). In Colombia, Ocampo *et al.*, (2005) reported that farmers did not control breeding at all and that led to farmers being unable to know the performance potential of individual pigs.

Routine pig husbandry practices included; Iron injection (16%), tooth clipping on piglets (12%) and castration of all male piglets not intended for reproduction. All farmers kept pigs under intensive production system. The major constraints identified were; lack of quality breeding stock (with 95.2% sourcing the local breeds), high feed cost (95%), lack of suitable pig housing structures (87.5%), diseases and pests management (83.7%), poor marketing (6.7%), non membership to farmers' groups or associations (49%), and no record keeping (2%).

Main disease and pest challenges encountered were worm infestation (80.8%), fleas (31.7%), mange (13.5%) and pneumonia (4.8%). Farmers had knowledge on common diseases.

Conclusion and Recommendations:-

The preferred production system is the intensive mixed production system. Large white was the preferred pig breed. The major constraints to pig production were; lack of high quality breeding stock, high cost of commercial feeds, poor pig housing and diseases and pest management.

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