Volume : 2 | Issue : 9 | Sept 2013 • ISSN No 2277 - 8160

Research Paper | Animal Science

Pig Farmers Knowledge of the Prevalence of Mycotoxin in Feedstuffs : A Case Study of Pig Farms in Nsukka Agricultural Zone of Enugu State - Nigeria

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ABSTRACT

A study was conducted to evaluate pig farmers' knowledge of the prevalence of mold contamination and the risk of mycotoxin poisoning of their animals. Seventy two pig farmers in Nsukka Agricultural Zone of Enugu State, Nigeria were used for the study. Structured questionnaires which were validated by an Agricultural measurement and evaluation experts in the Department of Agricultural Economics of the University of Nigeria, Nsukka were used to collect data from the pig farmers. The data collected were analyzed using descriptive statistics option of Genstat computer package (Discovery edition 3). 95 per cent of the farmers had sufficient knowledge that pigs are vulnerable to mold contaminated feedstuffs which may predispose the animals to mycotoxin poisoning. Responses from the farmers indicated that palm kernel cake, Bambara waste, cassava peels, cassava roots and brewers spent grains were the feedstuffs frequently used to feed pigs in the area. Result indicated that Bambara waste was more prone to mold contamination, whereas cassava peel was the least contaminated by molds. 90 percent had measures in place to curb mold contamination of the common feedstuffs the use in feeding their pigs. The pig farmers were also able to interpret clinical signs of mycotoxin poisoning arising from mold contamination of the feedstuffs. It is concluded that pig farmers in Nsukka Agricultural Zones have knowledge of mold contamination of the feedstuffs they commonly use and already have measures in place to checkmate mold contamination of their feeding stuffs.

KEYWORDS: Mycotoxin, contamination, feedstuffs, pig

Introduction

Pigs as monogastrics require the same primary energy and protein feedstuffs as man for their sustenance and growth. To reduce the pressure on these primary energy and protein feedstuffs, pig farmers in Nigeria now feed their animals with agricultural wastes such as brewers spent grain, palm kernel cake, cassava peels, bambara wastes, discarded pawpaw fruits etc. The poor handling of these wastes often creates an enabling environment for the proliferation of molds with its attendant consequence on performance of the pigs and health of the consumer of pork emanating from such pigs.

Molds abound in nature and may be found in soil, plants, dead or decaying matter. They produce toxins known as mycotoxins. Some mycotoxins cling to the surface of mold spores, others may be found within spores. More than 200 mycotoxins have been identified from common molds (Anon. 2013). Feeding of mycotoxin contaminated feedstuffs to animals impairs feed intake, efficiency of feed utilization, animal health and immunity (Sun and Chen, 2003). Ingestion of mycotoxins can cause tissue and organ damage and eventually result in death of the ingesting animal or of any person consuming such animal product depending on the quantity and length of period it was consumed (Reddy and Farid, 2012). Akbar and Majid (2010) reported that 0.4ppm aflatoxin content in the diets of pigs from weaning to market weights will have negative effects on growth rate and health. This is due, in part, to decrease in feed efficiency of the contaminated feed. Piglets are more susceptible than adults and it has been shown that feeding sows aflatoxin contaminated feeds during lactation can cause stunted growth in the litter. Aflatoxin B1concentration of 0.3mg/kg reduced feed intake and weight gain of pigs by 28 and 22 per cent respectively.

The current trends where most pig farmers depend on agricultural or industrial wastes for feeding their pigs suggest that care must be taken to ensure that these feeding stuffs are devoid of mycotoxin contamination. There is need to investigate farmers awareness of the prevalence of mycotoxins in their feeding stuffs. Knowledge of mycotoxin prevalence will prompt farmers to seek appropriate routine management measures to minimize the levels of mycotoxins in feedstuffs. The present study seeks to determine farmers' awareness of the presence of mycotoxins in the common feedstuffs used by pig farmers in Nsukka Agricultural Zone of Enugu State, Nigeria.

Material and Methods

The study was carried out in Nsukka Agricultural Zone of Enugu State, Nigeria. The Zone is made up of six Local Government Areas (LGAs) namely: Nsukka, Igboeze North, Igboeze South, Igbo-etiti, Udenu and Uzo-uwani. A multiple sample approach as proposed by Okoloh *et al*., 2013 was used. A sample of six autonomous communities were identified in each of the LGAs and used for the study. Twelve pig farmers were randomly selected from each autonomous community and structured questionnaires administered on each of the farmers, thus giving a total of seventy two respondents. The questionnaire was validated by two experts in instrument measurement and evaluation from the Department of Agricultural Economics, University of Nigeria, Nsukka.

Statistical Analysis

The data from questionnaires were analyzed, using descriptive statistics such as frequency and percentages. Genstat computer package (Discovery edition 3) software was used to analyze the data.

Results and Discussion

Socioeconomic Characteristics

95 per cent of the pig farmers interviewed were married. The same percentage of the farmers had only the basic First School Leaving Certificate. Only 5 per cent had School Certificate and higher qualification. All the pig farmers randomly selected for the study were males. 50.0 per cent of the farmers had a flock size of less than twenty pigs, whereas 42 per cent had between 21- 49 pigs and 8.0 per cent had above 50 pigs. The result on the marital status of the pig farmers is in agreement with earlier report of Ezedinma (2012) who observed that married people have the responsibility to provide, process and market food for the household. The author opined that pig farming serves as a source of income to train their children in school and meet other financial needs of the family. The response on educational qualification shows that pig farming in Nsukka Agricultural Zone is dominated by persons with

merely basic education. This level of education may affect their attitude and perceptions towards adopting modern methods of pig husbandry. This is in harmony with the view of Ajala (1992) that level of education has a positive correlation with acceptance and adoption of agricultural innovative techniques. Pig Farming in the study is dominated by males. Pigs are sturdy in nature and require tough handling to make management easy. This nature of the pig will easily scare women from wanting to go into its production. Rather the women prefer to be involved in the marketing of pork and life pigs. Adesiji *et al*., (2012) observed that males are more capable of doing tedious work associated with farming than females. The number of pigs reared by the respondents in this study is a clear indication that pig farming in Nsukka Agricultural Zone is mostly run by small holder farmers. This level of operation is in harmony with the educational qualification of the operators. Government need to empower graduates in the study area to operate big farms with large animal holdings to provide enough pork for the already animal protein deprived populations in the zone.

Feedstuffs used by Pig farmers.

The results of the responses from the respondents showed that palm kernel cake, bambara nut waste, cassava peels, cassava root, and brewer spent grains are the major feedstuffs, frequently used in these areas to feed pigs (see Figure 1). This is in tandem with the findings of Babatunde and Hamzat (2005) that agricultural by-products and industrial wastes are good alternative feedstuffs for sustainable livestock production.

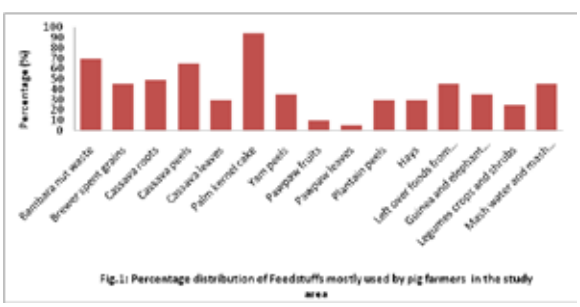


Fig.1: Percentage distribution of Feedstuffs mostly used by pig farmers in the study area

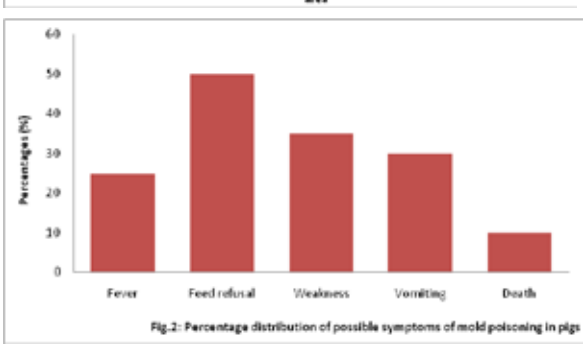


Fig.2: Percentage distribution of possible symptoms of mold poisoning in pigs

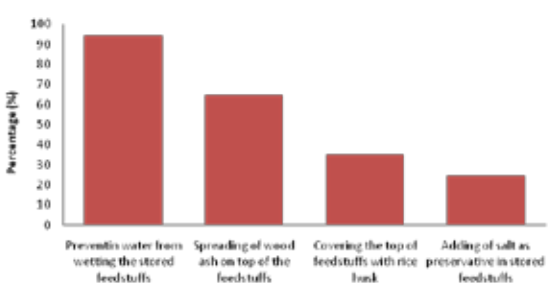


Fig. 3: Percentage distribution of preventive measures applied and adopted by the farmers

Knowledge of Mold Contamination of Feedstuffs.

Results showed that 95% of the pig farmers have sufficient knowledge that pigs are vulnerable to mold contaminated feedstuffs, while 5% neither agree nor disagree with pig vulnerability to mold infested feedstuffs. This implies that majority of the pig farmers are aware of the vulnerability of pigs to mold contaminated feeds and the implications of feeding mold contaminated feeds to pigs. Knowledge of a phenomenon is a determinant of attitude towards the issue (Okoloh *et al*, 2013). The practical implication is that having knowledge of mold contaminated feedstuffs and the risk of mycotoxin poisoning will place the farmer in a better position to prevent mycotoxin poisoning and been able to detect symptoms of mycotoxin poisoning in his animals. Arising from their knowledge, majority of the farmers (42.0 %) affirmed that Bambara waste was more predisposed to mold contamination whereas 25 % each indicated that palm kernel cake and brewers spent grain are next to bambara waste in terms of mold contamination. Only 8% agreed that cassava peel can easily be contaminated with molds. These believe may be responsible for the apparent dominance of cassava peels as a feeding stuff for pigs in the study area. Signs and symptoms shown by pigs when fed mold contaminated feeds showed that 50% of the pig farmers indicated feed refusal, 35% indicated weakness, 30% indicated vomiting, 25% indicated fever while 10% indicated death (see Figure 2). This is in agreement with Lin *et al.,* (2004) who stated that pigs consuming aflatoxins contaminated feeds shows the above signs and symptoms over a given period of time depending on the quantity consumed over time and the length of exposure. To reduce the mold contamination of feedstuffs 90% of the farmers stated that they prevent water from wetting the stored feedstuffs in the sack bags and use wooden slabs as a bedding on which the sack bags were kept, while 65% indicated that they use to spread wood ash on top of the feedstuffs in sack bags or in drums with cover, 30% indicated covering the feedstuffs especially brewer spent grains with rice husks and lastly 25% indicated the addition of salt as a preservative substance in the stored feedstuffs. These approaches used by the farmers to reduce mold contamination of their feedstuffs have strong scientific basis. Exposure to high moisture and relative humidity creates a fertile environment for molds to grow. This practice is in agreement with the findings of CAST (2003) that the conditions conducive for fungal development and growth are exposure to moisture, relative humidity of 80% or above, temperature range of 27 - 30°C, ear injury caused by insects or birds as well as drought stress.

Conclusion

It is concluded that majority of pig farmers in Nsukka Agricultural Zone have knowledge of mold contamination of feedstuffs. They can detect signs of mold poisoning in pigs and have adopted local practices to reduce to the barest minimum mold contamination of feedstuffs. In view of the public health implication of consuming pork with mold poisoning , we recommend that extension agents of the state should educate the farmers on approaches to source mold free feeding stuffs for their flock in tandem with global best practices.

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