RESEARCH OPINIONS IN ANIMAL & VETERINARY SCIENCES
PRINT ISSN 2221-1896, ONLINE ISSN 2223-0343
www.roavs.com

Prevalence of diseases of pigs in Botswana

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Abstract

This paper is a review of diseases of pigs from 1997 to 2007. Lack of health management reduces animal performance. This review showed that bacterial and non-infectious diseases were a major challenge in pig production. The 10 most common diseases of pigs in order of importance were septicaemia, traumatic injuries/torsions, coli-septicaemia, stress, pneumonia, cystitis, colibacillosis, salmonella, mange and nutritional deficiencies with 72, 68, 53, 38, 36, 21, 18, 14, 12 and 10 cases recorded, respectively. Other diseases and conditions recorded sporadically included coccidiosis, brucellosis, toxoplasmosis, actinomyces, urolithiasis, aflatoxicosis, meningitis, pasteurella, and other miscellaneous conditions caused by microbial infestation from stomach or colic raptures. Mange and ascariasis were the main parasitic diseases recorded. The high prevalence of diseases suggests inadequacy of biosecurity measures. In order to reduce disease outbreaks and spread, strict biosecurity measures should be put in place on pig operations.

Keywords: Biosecurity, Non-Infectious Diseases, Nutritional Deficiencies, Parasitic Diseases, Pigs

Introduction

Efficient pig production is dependent upon a healthy herd. Production diseases resulting from a deficiency or a combination of deficiencies in management, housing, breeding, climatic environment and nutrition can cause economic losses. Galeboe et al. (2009) reported that pests and diseases are some of the major constraints in commercial pig production in Botswana.

According to Payne (1992), diseases that are mainly found in breeding stock are brucellosis, leptospirosis, metritis, mastitis and agalactia. Brucellosis and leptosporosis may be the cause of abortion or birth of weak piglets. These two along with agalactia also cause sterility. Mastitis and agalactia are difficult to control and result in weak piglets and increased piglet mortality. Additionally, pigs in the tropics suffer from the effects of two external parasites mites (*Sarcoptes scabiei* var. *suis* and *Demodex phylloides*) and lice (*Hematopenus suis*). Internal parasites are also the cause of considerable mortality, lack of vigour and unthriftness in young pigs. The most important internal parasites are lungworms (*Metastrongylus spp.*), intestinal roundworms (*Ascaris lumbricoides* var. *suis*), nodular worms (*Oesophagostomum* spp.); threadworms (*Strongyloides spp.*), whipworms (*Trichuris* spp.) and the kidney worm (*Stephanurus dentatus*). Other causes of ill health are the ingestion of pollutants and poisons, as well as, nutritional diseases such as anaemia in piglets caused by deficiency in iron; and parakeratosis due to zinc deficiency.

Pig production in Botswana is in its infancy. As a result, the majority of farmers and extension staff have little knowledge on health aspects of pigs. Poor husbandry practices characterise most of the pig operations in Botswana resulting in reduced performance due to frequent disease outbreaks. This paper examines data on diseases and parasites of pigs in Botswana from 1997 to 2007.

Diseases

Table 1 shows diseases that were diagnosed in pigs at Botswana National Veterinary Laboratory (BNVL) in Botswana over a 10 year period. As shown in Table 1, 537 cases of pig diseases were recorded from 1997 to 2007. Bacterial diseases constituted 287 (53.4 %) of diagnosed cases, followed by non-infectious diseases with 226 (42.1%) cases. These data indicate that pigs in Botswana are affected mostly by bacterial and non-infectious diseases (i.e., torsion, traumatic injuries, fractures, stress, starvation, food poisoning, nutritional deficiencies and strangulation of organs). The observation on non-infectious diseases (42.1%) raises serious welfare issues that need to be addressed if

production is to be raised to desirable levels. The prevalence of non-infectious diseases in this review suggests poor husbandry practices on farms, thus necessitating the need for improvements in housing and feeding.

Figure 1 illustrates the cases diagnosed positive during the study period. It is clear from Figure 1 that the highest cases (118) were observed in 2000 and the lowest in 1997 and 2006. On the overall, disease outbreaks declined over time probably because farmers had started to adopt strict biosecurity measures.

Table 1: Types of diseases and cases recorded from 1997 to 2007

Types of Diseases	Cases recorded	Percent
Parasitic	17	3.2
Viral	1	0.2
Bacterial	287	53.4
Fungal	6	1.1
Non-infectious	226	42.1
Total number of cases	537	100

Source: BNVL Reports (1997-2007)

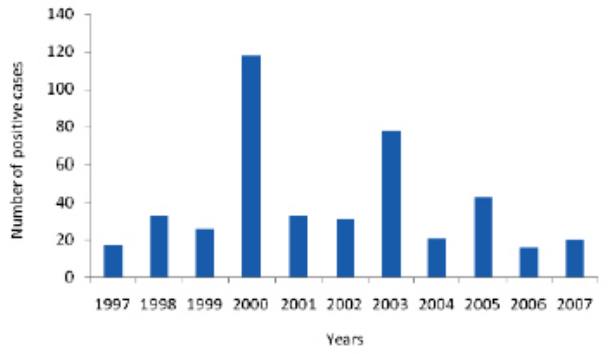

Fig. 1: Positive cases recorded from 1997 to 2007

According to Table 2, the five common diseases of pigs in Botswana in order of prevalence are septicaemia, traumatic injuries/strangulation, colisepti-caemia, stress and pneumonia. Other diseases that occurred sporadically were coccidiosis, meningitis, aflatoxicosis, ascariasis, enterotoxaemia, urolithiasis and other conditions caused by infection of bacteria on certain organs such as urinary tract. It is clear from Table 2 that no cases of colibacillosis were recorded from 2001 to 2007 probably due to farmers' improved management practices. According to Table 2, few cases of nutritional deficiencies such as rickets and hypocalcaemia occurred indicating that pigs were fed nutritionally balanced diets. In 2004 and 2006, the recorded cases were three and seven, respectively (Table 2). On the other hand, in 2003, the number of recorded cases exceeded the other years with 102 cases diagnosed followed by 2000 and 2005 with 93 and 38 cases, respectively. Furthermore, four and two cases of meningitis and aflatoxicosis were recorded, respectively. Meningitis is caused by a number of bacterial species such as pasteurella while aflatoxicosis results from ingestion of mouldy feeds.

Viral enteritis, which is a highly infectious disease caused by a corona virus was the only viral disease recorded in this review. The virus is killed by sunlight within a few hours but will survive for long periods outside the pig in cold conditions. Corona virus is susceptible to disinfectants; particularly iodine based ones such as quaternary ammonium compounds. Prolonged acute diarrhoea in piglets is a sign of viral enteritis. Antibiotic treatment administered orally in individual piglets may reduce secondary infections. Additionally, Food and Agriculture Organization (1999) reported an outbreak of African swine fever in Botswana in 1999.

Table 3 presents the disease causing agents and their control measures. Klebsiella, staphylococcus, corynebacterium, pasteurella, and salmonella species were the common bacteria species isolated from diseased organs (Table 3). Radostits *et al.* (2000) reported that *Actinobacillus spp*., other than *Actinobacillus pleuropneumoniae* is considered opportunistic pathogens in pigs. *Actinobacillus spp*., including *A. suis*, *A. equuli*, and *A. ureae* can result in abortion, septicaemia, and polyarthritis in pigs. Tetracycline or penicillin is used for treatment.

According to Table 4, septicaemia and colisepti-caemia are the most common diseases of pigs in Botswana with 84 and 70 cases recorded, respectively. From 1997 to 2007, only two cases of toxoplasmosis were recorded making toxoplasmosis the least common bacterial disease in pigs. Furthermore, Segwagwe and Sharma (2007) reported for the first time in Botswana a confirmed case of swine erysipelas caused by *Erysipeldthrix rhusiopathiae* in the piggery unit of the Botswana College of Agriculture.

Non-infectious diseases that affect pigs include deficiency diseases, injuries, traumas, stress and other conditions that cannot be transmitted from one pig to the other (Table 5). According to Table 1, non-infectious diseases are the second most important after bacteria. In this study, it appears that torsion and strangulation of organs are the common non-infectious diseases of pigs in Botswana.

Parasites and parasitic diseases

In this study, mange and ascariasis were the only parasitic diseases of pigs recorded. During the review period, 12 and 4 cases of mange and ascariasis were recorded, respectively. Mange is an external parasite and is transmissible very fast and can be transmitted from new stock to existing stock in a few days. On the other hand, ascariasis is the infestation of internal round

Table 2: Ten most common diseases of pigs in Botswana

Year	Colisepticaemia	Septicaemia	Pneumonia	Stress	Nutritional deficiencies	Mange	Cystitis	Traumatic injuries/ strangulation	Salmonella	Colibaillosis	Total
1997	3	5	0	1	0	1	1	4	1	0	16
1998	4	3	6	1	0	0	0	1	1	0	16
1999	10	0	1	0	3	0	0	6	1	0	21
2000	34	35	10	2	3	1	2	1	4	1	93
2001	0	0	0	7	0	1	3	0	4	2	17
2002	0	0	0	0	0	0	0	12	0	4	16
2003	0	10	14	23	2	0	14	28	0	11	102
2004	0	1	1	0	0*	1	0	0	0	0	3
2005	0	18	4	1	2	2	2	7	2	0	38
2006	0	0	0	3	0	1	0	2	1	0	7
2007	0	0	0	0	0	5	0	7	0	0	12
Total	51	72	36	38	10	12	22	68	14	18	341

Source: BNVL Annual Reports (1997-2007)

Table 3: Disease causing agents and their control measures

Causative agents	No. of cases	Signs	Prevention	Treatment
Klebsiella spp.	16	Inflammation of teats	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Streptococcus spp.	6	Rough coat, rapid death in piglets	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin
Staphylococcus spp.	12	Isolated in abscesses	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Clostridium perfringes	6	Rapid death in piglets	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
E. coli	9	Isolated in abscesses	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Pasteurella spp.	11	Dyspnoea, nasal discharge	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Corynebacterium spp.	12	Vaginal discharges	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Enterobacteria spp.	6	Sick piglets on second day of life	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Actinomyces spp.	6	Vulval discharge, haemogloburea and depression	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline
Salmonella spp.	12	Sudden death, diarrhoea and dysentery	Slaughter of animals that do not respond to treatment and regular disinfection	Penicillin/ tetracycline

Source: BNVL Annual Reports (1997-2007); Radostits *et al.* (1994); Taylor (1997)

worms in pigs. These parasitic diseases are encouraged by dirty floors and farrowing facilities.

Conclusions

Bacterial diseases were the most prevalent followed by non-infectious diseases. In order of importance the most common diseases of pigs in Botswana are septicaemia colisepticaemia and strangulation/torsions. Mange and ascariasis were the only parasitic diseases of pigs recorded. *Sarcoptes scabiei* was the most common ectoparasite and *Ascaris suis* the common endoparasite. These findings suggest that hygiene and biosecurity on farms are inadequate.

Table 4: Bacterial diseases from 1997 to 20007

Diseases	No. of Cases	Signs	Prevention	Treatment
Coli-septicaemia	70	Sudden death	Injection with tetracycline, penicillin/streptomycin or sulphonamides	Alteration of diet, antimicrobial therapy
Pneumonia	16	Coughing and loss of condition	Injection with tetracycline, penicillin/streptomycin or sulphonamides	Broad spectrum antibiotics such as tetracycline, penicillin streptomycin or amoxicillin
Colibaillosis	13	Diarrhoea	Injection with tetracycline, penicillin/streptomycin or sulphonamides	Broad spectrum antibiotics such as tetracycline, penicillin streptomycin or amoxicillin
Toxoplasmosis	2	Abortion, mummified, or weak piglets	Separation of cats from pigs	Live vaccine
Septicaemia	84	Sudden death	Intravenous treatment with antibiotics	Alteration of diet, antimicrobial therapy
Enterobacteria	6	Sudden death	Regular cleaning with antiseptic	Broad spectrum antibiotics such as tetracycline, penicillin streptomycin or amoxicillin

Source: BNVL Annual Reports (1997-2007); Radostits *et al.* (1994); Taylor (1997)

Table 5: Non-infectious diseases affecting pigs in Botswana

Diseases	No. of cases	Signs	Prevention	Treatment
Torsion (stomach, liver)	30	Extremely distended abdomen, which is bloated	Change diet and give the animal exercise	Surgery
Traumatic injuries	4	Animal not exited when approached	Sound husbandry practices	Surgery
Stress	6	Animal weak and unproductive	Sound husbandry practices	Vitamin A supplements or stress packs
Fractures	3	Animal static	Sound husbandry practices	Surgery
Heat stress	7	Panting heavily	Sound husbandry practices	Put animals in well ventilated and soared
Strangulation of organs	25	Distended and bloated abdomen,	Sound husbandry practices	Surgery
Starvation	3	Unthriftiness, trembling	Sound husbandry practices	Provide feed
Food poisoning	6	Diarrhoea, vomiting, abdominal pain	Sound husbandry practices	Provide fresh feed and water
Nutritional deficiencies	11	Unthriftiness	Feed fresh and nutritionally balanced diets	Feed the correct diets to animals

BNVL BNVL Annual Reports (1997-2007); Radostits *et al.* (1994); Taylor (1997)

Therefore, there is need for improved extension service or technical support to the pig farmers.

Acknowledgements

We acknowledge Botswana National Veterinary Laboratory for their support.

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