



UNIVERSITI PUTRA MALAYSIA

**SURVEY OF VETERINARY PHARMACEUTICAL PRODUCT USAGE IN
SOME PIG FARMS**

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**SURVEY OF VETERINARY PHARMACEUTICAL PRODUCT
USAGE IN SOME PIG FARMS**

by

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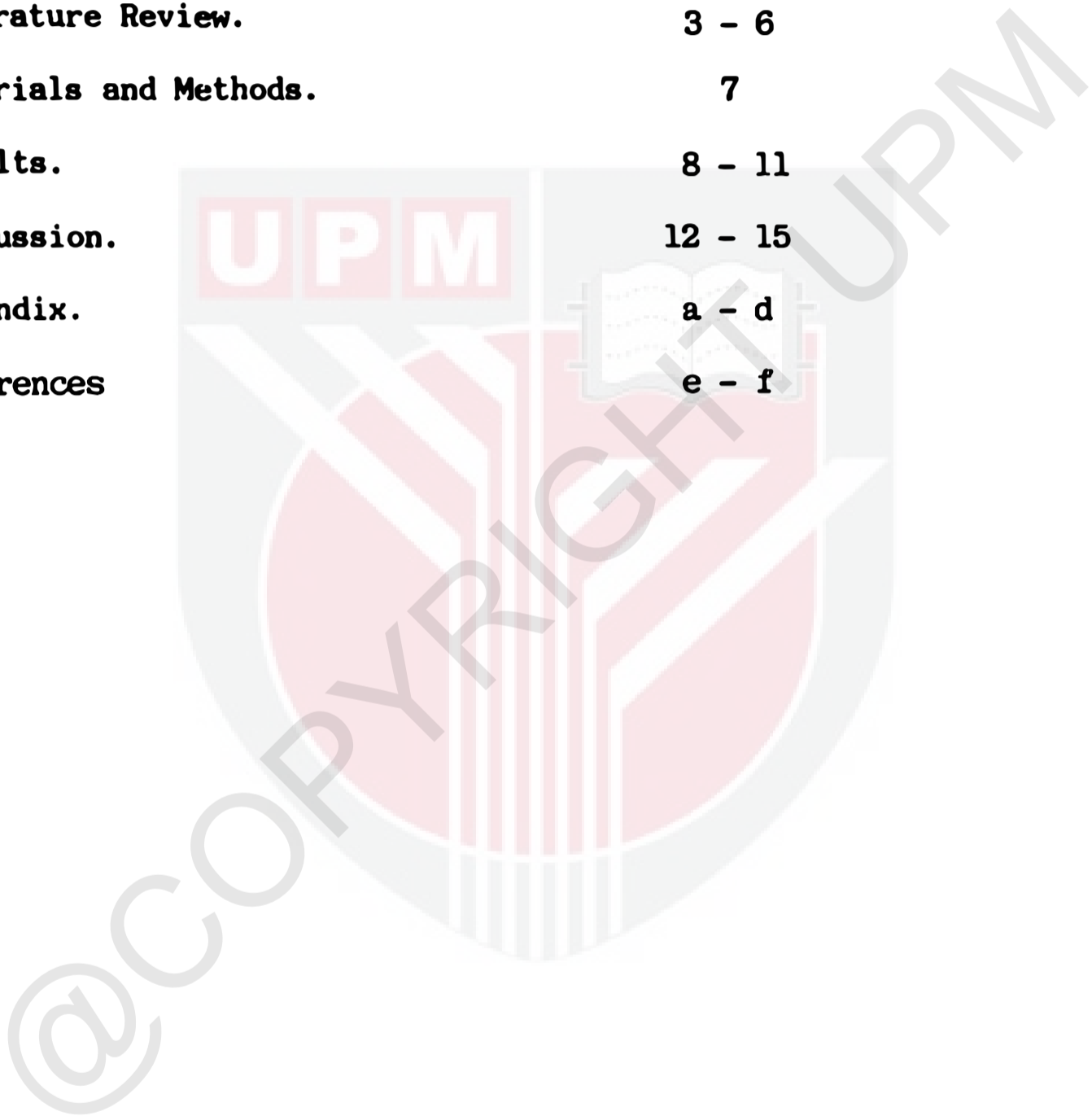
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Abstract.

Twenty-two pig farms in States of Selangor and Negeri Sembilan were interviewed based on a prepared questionnaire. The objectives of this study were to determine the handling, storage, dispensing, costs and the types of veterinary pharmaceutical products used in these pig farms. The most common antimicrobials used were chloramphenicol, neomycin, kanamycin, tetracycline, ampicillin, sulphonamides, streptomycin and tylosin. 55% of the farms surveyed did not have any veterinary supervision. Furthermore, it was noted that the Department of Veterinary Services seldom provides its services to these farms. Naturally, pharmaceutical companies provided the most technical services to these pig farms. The calculated cost index was between \$1.90 and \$2.20. Finally, further legislation, more regulatory agencies and more consumer education might help check abuses.

Abstrak

Dua puluh dua buah ladang babi di Neger-negeri Selangor dan Negeri Sembilan ditemu- soal. Objektif- objektik penyelidikan ini adalah untuk mengenalpasti cara- cara penggunaan, simpanan, jenis- jenis ubat dan kos pembelanjaan dalam penggunaan ubatan veterinar. Antimikrobial- antimikrobial yang paling lazim diguna ialah chloramphenicol, neomycin, kanamycin, tetracycline, ampicillin, sulphonamides, streptomycin dan tylosin. 55% peternak- peternak babi merawat babi- babi mereka menggunakan pengalaman tanpa pertolongan veterinar. Di samping ini, Jabatan Perkidmatan Haiwan kurang memberi perkidmatannya kepada peternak- peternak tersebut. Lazimnya, syarikat- syarikat ubat veterinar yang lebih memberi perkidmatan veterinar mereka. Kos indeks yang dikira ialah di antara \$1.90 dengan \$2.20. Akhirnya, dengan pembentukan undang- undang , lebih agensi penyelarasan dan pendidikan konsumer mungkin dapat menolong mencegah penyalahgunaan ubat- ubat tersebut.

Introduction.

The swine industry in Peninsular Malaysia is an important component of the livestock sector; it contributes about 34% of the total gross value of the livestock produce. The intensification of the veterinary services, coupled with the post-war economic boom and the development of feed milling and other ancillary industries provided the impetus for the larger commercial farm (Babjee, 1983). To support the rapid development and performance of the swine industry in this country, a parallel development in the herd health programme is much needed. This led to the prophylactic and therapeutic use of pharmaceutical products such as vaccines, chemicals and veterinary drugs. However, the extent of these usage has never been ascertained much less documented in Malaysia. There are several reasons to the lack of information. The fear of the pig farmers revealing their secrets especially to Government personnels is real. Nevertheless, of recent times, farmers have consented for the public servants to collect some basic data. Furthermore, the farmers always cherished their so-called trade-secret. Sharing whatever techniques to success is taboo according to one farmer. Thirdly, the easy access to a broad range of pharmaceutical products is of no help at all. The veterinary drug companies have always come up with the latest products to add to the shelves. Complicating matters further, most researchers and veterinarians resign to the sad fact that today's panacea is tomorrow's history. Finally, poor or the lack of proper record keeping has contributed to the lack of reliable information. This survey

was carried out with the following objectives:

- 1) to determine the vaccines, chemicals and veterinary drugs used in the pig farms.
- 2) to ascertain the handling , storage, dispensing and veterinary supervision of these products.
- 3) to determine cost involvement of these pharmaceutical products.



Literature review.

A. Background.

Lee, 1986 asserted that the current key issues confronting the livestock industry in Malaysia are related to marketing of livestock produce rather than farm management or disease-control. This holds true because Malaysian farmers have reached a stage where their production efficiency has improved tremendously. However, the mastery of both animal husbandry and disease control had led to such production efficient circumstance.

1. Methods of disease- control.

Within his own and outside resources, farmers have developed an enthusiastic approach towards prophylactic and therapeutic measures for the control and prevention of disease. Their measures come in the form of pharmaceutical products administered to the animals or the environment. Furthermore, farmers have also developed animal hygiene measure (Salam,1986). Thirdly, with the advancement of animal breeding techniques, new animals bred may phenotypically able to withstand onslaught of certain diseases (Mayr,1984). With exception of prophylactic and therapeutic measures for disease control, animal hygiene and animal breeding procedures are geared towards minimization of usage of pharmaceutical products. Unfortunately, minimization of pharmaceutical products usage especially antimicrobials are never dictated by animal hygiene and animal breeding alone. In Malaysia, there are other factors needed to be considered.

2. Factors confronting minimization of drugs.

Lau, 1982 reported in his survey that about 54% of the total number of farms in Sungei Buloh was small-holders. Consistently, Kuan, 1984 asserted that 55% of the 5873 farms in the whole of Peninsular Malaysia was small-holders. According to Lau, 1982 a farm is considered as small-holder if it has a herd size of 5-45 sows. Normally, the small-holders lack disease-control measures like quarantine bays (Lau, 1982), foot-baths, personnel disinfecting facilities, etc. Furthermore, according to a study by Yap et al, (1986) farms in the state of Selangor were lacking in proper waste-disposal system. Interesting enough, Tan and Muniandy, 1980 reported of antibiotic-resistant enterobacteriaceae from polluted environmental sources. They also claimed of infection of the transfer of diseases to animals via these organisms. Thus, it can be gathered that zoo-sanitary measure or rather the lack of it holds back minimization of drug usage for control and prevention. Secondly, farmers often have easy access to a broad range of pharmaceutical products such as antimicrobials. The Poison Ordinance, 1952 according to Salam, (1986) allows farmers to procure medicants without direct control of veterinarians. Consequently, many farmers especially the small-holders often juggled with veterinary drugs to treat their animals without basic knowledge on pharmacology.

3. Consequences of minimization and handling failure.

In the research scene, Joseph et al, (1978) reported of antimicrobial resistant salmonella strains towards furazolidone, polymycin B, colistin and chloramphenicol (all <2%). However, dihydrostrep-

tomycin and Triple sulfa showed 89.1% and 79.6% resistant respectively. Furthermore, Bahaman et al, 1985 reported of resistant E.coli in tetracycline (84%), streptomycin (77%), sulfonamides (72%), neomycin (26%) and chloramphenicol (13%). However in the Australian scene, Murray et al, 1986 reported of resistant salmonella strains of considerably lower frequency. The organisms showed resistance to streptomycin (22%), tetracycline (29%), ampicillin (3%), furazolidone (2%), neomycin (4%), and chloramphenicol(1%). The contrast such be of concern to the Authority because of public health implication. Furthermore, greater pharmaceutical products usage means greater bite into the operational cost. This is obvious as farmers need to change veterinary drugs often due to the possible loss of their effects. In short, the direct consequences are the development of antimicrobial-resistant organisms and greater operational cost.

4. Suggetions to check abuses of veterinary drugs.

Mayr, 1983 suggested that though legislation is important, nevertheless continuation of research into safer use of drugs should be maintained. Furthermore, according to Brant,(1986) government regulatory agencies should continually check on meat products and antimicrobial resistance trend. Thirdly, consumer education can also play an important role. Brant,1986 maintained that United States consumers often reject animal products which they are not convinced of. Hence, legislation, further research. regulatory processes and consumer education can help check abuses.

5. Vaccination.

Commonly use in Malaysia as immunoprophylactic measure. Webster et al., (1985) reported of various vaccines used in Singapore for the various viral diseases. In Malaysian scene, researches on the efficacies of pseudorabies vaccine (Lee et al., 1979) and E. coli bacterins (Joseph et al., 1977; Bradenburg, 1980.)

6. Veterinary services.

Babjee, 1983 asserted of the lack of active role of the Dept. of Veterinary Services in providing health and extension services to the farmers. Consequently, farmers had to turn to others for advice. However, the farmers are not complaining because the Feed and Drug companies veterinarians are able to provide the necessary technical information.

Materials and Methods.

Twenty- two pig farms in the states of Selangor and Negeri Sembilan were surveyed. The herd sizes of these farms were small (6 farms), moderate (7 farms) and large (9 farms)*. During the survey, the farmers were interviewed based on a prepared questionnaire (Appendix 1). In addition to the interview, the farms in particular their drug and chemical stores were also inspected. Names of pharmaceutical products and vaccines used as well as the way the products were handled and dispensed by the farmers were recorded. Availability of veterinary services to the farms was also noted. Analysis of pharmaceutical cost in relation to operation cost and standing pig population was calculated using the following formulae:

i. $\text{Pharmaceutical per centage} = \frac{\text{Total pharmaceutical cost**} \times 100}{\text{Operation cost}}$

ii. $\text{Cost index} = \frac{\text{Total pharmaceutical cost}}{\text{SPP***}}$

* Small farms (4- 45 sows), Moderate (50- 150 sows), Large(>150 sows). Lau, (1982)

** Total pharmaceutical cost- include only swine fever vaccine.

*** Standing Pig Population No.of sows and gilts x 10 (Personal communication)

Results.

A broad range of pharmaceutical products were used on these pig farms. They are listed as follow:

<u>1. Antimicrobials.</u>	<u>No.of farms.</u>
a. dihydrostreptomycin	7
neomycin	10
spectinomycin	3
kanamycin	6
gentamycin	2
virginiamycin(in-feed)	unknown
kitamycin	1
b. ampicillin	5
procaine penicillin	5
penn-streptomycin	3
bicillin	1
<u>c. sulfur-based drugs</u>	
Trivetrin*	6
Tribressen*	7
Sulfamethazine	4
d. oxytetracycline	8
chlortetracycline	1
chloramphenicol	13
colistin*	2
Dynamutilin*	5
tiotilin*	unknown
tylosin	8
furazolidone	2
dimetrodiazole	2

2. Disinfectants.

Lindores*
Lento*
Lime
Mefarol*
Lysol*
Antec farm fluid*
Formalin 40%
Pacoma*
Iodophors
Malathione.

Liming farrowing crates were the most common practice in the farms as it was cheap and easily available. However, it was

farms as it was cheap and easily available. However, it was observed that only 5 farms surveyed had foot-baths, 3 farms with facilities for disinfecting vehicles and visitors respectively. Needless to say, only the larger farms had these facilities.

3. Others.

Gusannex*	Nilverm*
Negasunt*	Levamisole
Malathione	Fenbendazole
Hygromycin	

4. Minerals and Vitamins supplement.

a. Iron dextran

Ferofax 200*	Feridex*
Gleptosil*	Leucofar* (Iron dextran and tylosin)

b. Vitamin B complex.

5. Antipyretics.

Bonpyrin*
Supyrin*

6. Vaccines.

Table A. Type of vaccines used in pig farms.

Vaccine type	No. of farms	Source
Swine fever	20	a. VRI, Malaysia b. France
Aujezky's disease	9	a. France b. Holland
<u>E.coli</u>	2	a. USA b. Holland c. Autogenous

* denote trade-name.

Type of veterinary services available to pig farmers.

Table B. Types of veterinary services available to pig farmers.

<u>Service-type</u>	<u>No. of farms</u>
Government Veterinarian/VA	3
Drug Co. Veterinarian	8
Feed Co. Veterinarian	2
Own Veterinarian	6
No veterinary service	12
Mixture	9

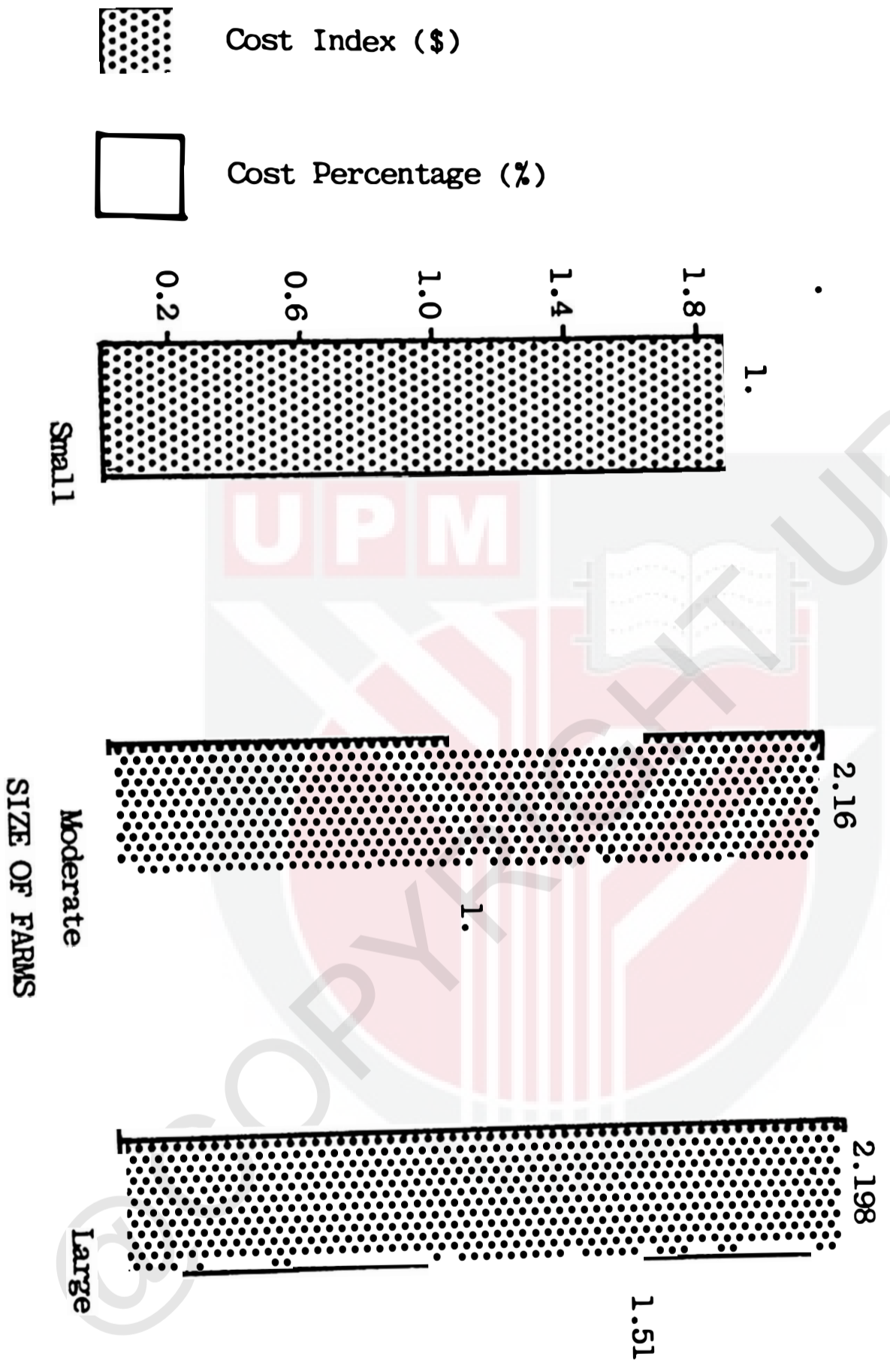
Table C. Breakdown figures on type of veterinary services.

<u>Service- type</u>	<u>Farm type</u>		
	<u>Small</u>	<u>Moderate</u>	<u>Large</u>
Government Vet./VA	0	2	1
Drug Co. Vet.	2	3	3
Feed Co. Vet	0	1	1
Own Vet.	1	1	4
No veterinary service	5	5	2
Mixture	2	4	3

The analysis of variance showed that there were no significant difference in the pharmaceutical products used in the three types farms (Appendix 2). These were tested so at the confidence level of 95% and 99%. On the other hand, it was observed that farms serviced by pharmaceutical companies used much more pharmaceutical products as compared to the other farms not serviced by the former companies (Appendix 3). This was so at the confidence level of 95%.



COST INDEX & PERCENTAGE
OF PHARMACEUTICAL PRODUCTS



Discussion.

Obtaining all the relevant information on the pharmaceutical products used in the pig farms may help to provide the veterinary and public sector a fair idea on the extent of their usage in the farms.

Pharmaceutical products.

The survey shows a long list of antimicrobials, disinfectants and other veterinary drugs used by the pig farmers either for prophylaxis or therapy. The most common antimicrobials used are chloramphenicol, neomycin, kanamycin, ampicillin, sulfonamides oxytetracycline, tylosin and streptomycin. Among the antimicrobials listed, chloramphenicol is the most frequently used. This is due to the fact that these drugs are easily available and insufficient veterinary supervision. Most of the farmers interviewed treated their animals themselves using the drugs which they obtained either from sundry shops or drug company sales representatives. Once the animals recovered, they would consider the drugs as effective. However, they are not hesitant to change to new drugs for the treatment of their partly because the drugs are easily available. It was observed that most of the farmers did not store their veterinary drugs properly under locks and keys.

Indiscriminate usage of veterinary drugs especially antimicrobials have led to the emergence of antimicrobial-resistant organisms. Bahaman and Liman, (1985) have reported the emergence of resistant strains of *E. coli* to many antimicrobials. Joseph et al (1978) likewise reported the emergence of salmonella

strains which were resistant to many antimicrobials. However, a survey by Murray et al, (1986) in Australia showed lower frequency in resistance. A possible explanation to the difference could be the indiscriminate usage of these antimicrobials in Malaysia. Chloramphenicol has been banned in United States for use in food- animals for fear of development of resistant organisms. (Epstein et al 1986). Bahaman and Liman, 1985 reported that 13% of E.coli surveyed were resistant towards chloramphenicol. It is known that E. coli organism can transfer its R- factor to salmonella organism (Ansari et al, 1984). Salmonella strains have been known to cause gastro- intestinal and septicaemic diseases to human. Despite been a public health concern, chloramphenicol is still very popular to the farmers (List A). In addition to antimicrobials, iron supplement is been used by the farmers. This mineral is either injected or given orally to the piglets. However, the injectable route is more commonly practised by the farmers. Oral administration is relatively less common in the farms surveyed. Though this form saves labour nevertheless it could raise problems such as aspiration pneumonia and insufficient absorption of iron. The farmers give vitamin supplementation to smaller and weaker animals. Most farms disinfect their farrowing crate, only the larger farms have disinfecting facilities for vehicles, personnels and visitors. The list of disinfectants is given in List 2. Although Mayr (1984) and Tan and Muniandy (1980) advocated animal hygiene in order to reduce veterinary drug usage and possible infection via improper waste disposal, nevertheless, a comparison

of the 3 types of farms showed no significant variation in the amount of pharmaceutical products used. The cost index is between \$1.90 and \$2.20.

Swine fever vaccination is the most common. According to the survey, only 2 vaccinated farms came down with the disease. This could be due to expired or spoiled vaccines and improper vaccination programme. The attenuated vaccine are commonly obtained from Veterinary Research Institute, Malaysia and France. The imported vaccine costs twice the locally produced one. Some farmers still prefer to pay more due to several reasons such as lack of trust in the vaccine produced locally, familiarity with the imported one and convenient in acquiring the imported vaccine from sales representatives. Pseudorabies vaccination is given in areas endemic to the disease. However with careful hygiene management and control of animal and personnel movement, vaccination may not be necessary. E. coli vaccination is seldom practised in the farms surveyed.

2. Veterinary Services.

Most farms especially the small and moderate size farms do not have any veterinary services.(55%) The farmers diagnose, prescribe and administer veterinary drugs to the animals. It is noted that these farmers often read-up on animal husbandry from books and magazines. Sometimes, they exchange knowledge through discussion with fellow farmers. Consistent to report by Babjee,1983 only 14% of the farms consulted the Dept.of Veterinary Services. Of the farms, only the large farms have the

financial capability to employ own veterinarians. Finally, drug companies provide their services to most of the farms.(37%) and incidently, the farms serviced by drug company used more veterinary pharmaceutical products.(Table E). However the sample size and significant level at $P(<0.05)$ only does not warrant further extrapolation.

3. Check on mishandling of pharmaceutical products.

Legislation is important to check on mishandling of pharmaceutical products. The lack of the necessary veterinary supervision has led to abuses. Moreover, veterinary drugs should not be so easily obtained. Furthermore, there is a need of regulatory agencies to monitor quality of pork (Brant,1986).

Consumer education plays a role in educating consumers to demand safe pig products.

Appendix 1

Survey form no. _____

1. Farm size.

No. of boars:

No. of sows:

2. Management system.

3. Infrastructure.

Type.

**Farm vehicle
Roofing
Flooring
Farrowing crates
Pens**

4. Labour size.

No. of workers

Own labour.

Yes

No

Average cost of labour.(own and employed)

5. Feed.

Commercial feed

Own formulation

Swill

**if own formulation, under whose recommendation?
and the type of additive added.**

6. Veterinary pharmaceutical products.

Disinfectant:

Purpose:

Veterinary drug:

Types.

Total spent per year.

Vaccines:

Types.

Obtained from.....

Vaccination programme.

Total cost on vaccination per year (swine fever vaccination).

7. Veterinary Services.

Own Veterinarian..... Drug Co.Vet..... Feed Co.Vet.....

Government Vet..... No veterinary services.....

Who advises on the type and amount of veterinary drugs to use?

8. Health status of farm this current year....

9. Average age of porker when sold..... Weight.....

Cost of production....

10. Marketing:

Local..... Foreign.....

Appendix 2.

Cost indices for the various farms classified according to three farm sizes.

Farm sizes.

Cost indices.

Small 1.8, 3.0, 1.92, 1.92, 0.84

Moderate 3.36, 2.52, 0.96, 1.8

Large 4.2, 1.08, 2.64, 3.0, 1.56,
1.92, 0.96, 2.22.



Appendix 3.

Cost indices for the farms serviced by pharmaceutical companies group and the other non-pharmaceutical group.

Veterinary service- type

Cost indices

Pharmaceutical group*

1.92, 1.56, 3.36, 2.52,
4.2, 2.64

Non-pharmaceutical group**

1.8, 3.0, 1.92, 0.84,
0.96, 1.80, 1.08, 3.0,
0.96, 2.22, 1.92.

Pharmaceutical companies and personal experience.

** Government, feed, own veterinarian and personal experience.

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