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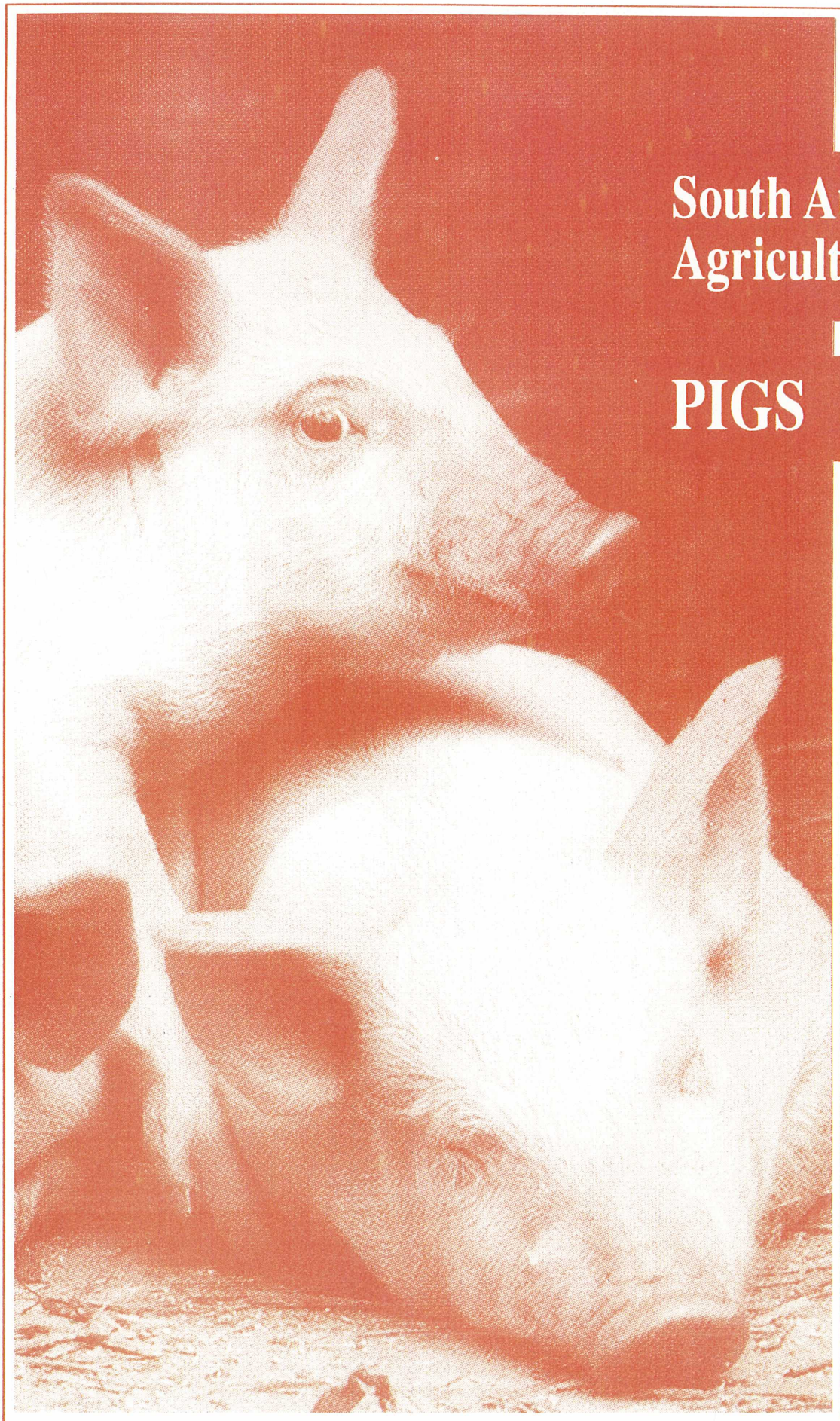

South Australian Agriculture

PIGS

DEPARTMENT OF AGRICULTURE
SOUTH AUSTRALIA

January, 1992

FOREWORD

This strategic plan is one of a series which has been developed for the principal South Australian agricultural industries and the services provided by the Department of Agriculture.

Agriculture contributes a greater proportion of returns to the State's economy than that of virtually any other state in Australia. It is therefore important to review the potential for the further development of agriculture in South Australia. These plans have been prepared by the staff of the Department of Agriculture in association with representatives of the respective agricultural industries and farmer organisations. The aim has been to identify the production potential and the market potential for the respective commodities and to thereby evaluate the opportunity which the state has to further develop its agricultural industries. At the same time, consideration has been given to identifying the most important issues to be addressed in the coming years to enable the state to achieve its maximum economic potential from agriculture. These plans will be valuable for determining the future provision of services to the rural community.

I should like to acknowledge the hard work and creative thought which both departmental staff and participants from industry and the farming community have put into the preparation of these plans.

John C. Radcliffe

(John C Radcliffe)
DIRECTOR-GENERAL OF AGRICULTURE

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1. EXECUTIVE SUMMARY

1.1 INDUSTRY STATUS

The Australian pig industry produced 4.9 million pigs for slaughter in the year to 30th June 1990 yielding 317,000 tonnes of pigmeat with a gross value of $629 million. Of this, South Australian slaughterings produced 40,800 tonnes of pigmeat with a gross value of $81 million. South Australia is a net exporter of pigs, with approximately 45% of pigmeat from pigs grown in South Australia being consumed interstate.

At 31st March 1990, South Australia had 428,000 pigs, representing 16.2% of the Australian total of 2.65 million pigs. At 1st September 1990, a total of 1,998 South Australian pig producers had re-registered pig brands.

The basis of the industry is the medium sized, efficient, family unit with from 50-200 sows. There are two large highly integrated corporations. Pig production is largely directed towards the domestic market. Australian pigmeat production is projected to rise to 370,000 tonnes per annum by 1994, from the current 317,000 tonnes per annum. Australian pigmeat exports (7,500 tonnes, value $31 million, 1989) are projected to decline to 6,000 tonnes, value $29 million, in 1994.

1.2 INDUSTRY POTENTIAL

Significant opportunities exist for increases in both domestic and export markets for pigmeat and for production increases and improvements necessary to satisfy increased demand.

These opportunities are to:

- increase per capita consumption
- increase pigs reared per sow per year
- reduce mortality rates, particularly preweaning
- improve feed efficiency
- improve carcase quality and weight ("heavy, lean carcase")
- apply new technologies (eg genetic engineering)
- increase pigmeat exports
- develop value-added products
- utilise piggery effluent as fertiliser
- improve performance in abattoir & processing sectors

1.3 BARRIERS TO ACHIEVEMENT OF INDUSTRY POTENTIAL

(Issues are identified as: *** very high priority; ** high priority; * lower priority but still important)

- variable product quality; association of fatness with pigmeat (***)
- training opportunities for piggery staff and managers (***)
- demographic and environmental issues (**)
- low reproductive performance (**)
- mortality level (particularly pre-weaning) (**)
- high capital costs of establishment and the cost of money (**)
- inefficiency of processing industry (**)
- reliance on domestic market (*)
- animal welfare issues (*)
- government regulation (*)
- shortage of industry representatives at a political level (*)
- water quality and quantity (*)
- feral pig population (*)

1.4 DEPARTMENTAL PROGRAMMES FOR THE PIG INDUSTRY

The Departmental programmes listed below have research, extension and industry service components.

1.4.1 Major current programmes

1. Pig health
2. Pig genetic improvement and breeding
3. Pig nutrition
4. Pig management and producer training
5. Pig reproductive performance
6. Pigmeat quality improvement
7. Provision of policy advice on the pig industry
8. Northfield Pig Research Unit (NPRU) operations

In terms of priority, the two highest priority barriers identified to industry progress related to pigmeat quality and producer training and improvement of management skills. On this basis, the programmes "Pigmeat quality improvement" and "Pig management and producer training" rank as highest priority.

As noted in the text, there is considerable interaction between these two programmes and the other major programmes.

The programmes "Pig health"; "Pig genetic improvement and breeding" and "Pig nutrition" are regarded as high priority, having major, direct influence on industry productivity and profitability. "Pig reproductive performance" is currently under-resourced, but it is recommended that increased emphasis is placed on this programme for reasons outlined in the text.

"NPRU operations" is a necessary programme for efficient conduct of other major programmes.

"Provision of policy advice on the pig industry" is necessary for the effective guidance of an important South Australian industry.

1.5 RESOURCES ALLOCATED TO PIG INDUSTRY PROGRAMMES

Resources allocated to the pig industry are concentrated at the NPRU. All of the Adelaide based pig specialists are located at the NPRU. Regional extension officers are located at Murray Bridge (Murray Lands region) and Nuriootpa (Central Region).

Personnel resources comprise:

Research officers:	2.1	(1 Trust funded)
Technical officers:	3.7	(2.7 Trust funded)
Industry extension officers:	3	
Veterinary officer (pigs):	1	
NPRU staff:	4	
Policy/management:	0.5	

Facilities at the NPRU include a 50 sow breeding and production unit, a pig physiology laboratory unit and an isolation unit for disease research work.

The pig industry commodity area directly employs 14.3 staff, representing 1.9% of the 752 Departmental staff allocated to research, extension and health and industry

regulation. In comparison, the value of pigmeat produced ($81 million) represents 3.2% of South Australia's gross value of agricultural production (1989-90).

The total annual direct expenditure in servicing the pig industry is calculated to be $745,300 (1990/91). (See Table 1 below for details.)

Table 1 lists, for each of the eight major Departmental programmes for the pig industry, the expenditures and sources of funds used. Expenditures comprise salaries/wages and operating expenditures from both State and non-State sources. Sources of funds comprise income, State funds and non-State funds.

The data in Table 1 indicate that of the total expenditure of $745,300 per annum, $513,300 (68.9%) is attributable to salaries and wages, while $232,000 (31.1%) is for operating expenses.

Of the total expenditure on salaries/wages, 74.8% is sourced from State sources, with 25.2% from non-State sources.

Of the total expenditure on operating expenses, 17.5% is sourced from State sources, while 82.5% is from non-State sources.

The sources of funds used are comprised of income $137,600 (18.5%), State funds $424,500 (56.9%) and non-State funds $183,200 (24.6%).

Table 2 gives an analysis of expenditure allocated to each of the eight major Departmental programmes identified earlier, 6.1 to 6.8. The analysis shows, for each programme, the percentage of total expenditure allocated to that programme. The expenditure on that programme is then split into that percentage provided from State funds and that from non-State sources.

Table 2 indicates that the majority of resources are currently allocated to the programmes of pig health, pig nutrition and pig genetic improvement and breeding. The programmes of pig management and producer training and of pig reproductive performance currently absorb relatively small amounts of resources allocated to pig industry programmes. The programmes, pig health and pig genetic improvement and breeding, receive the majority of their funding from non-State sources.

The cost of running NPRU activities approximates 26.9% of total resource use, of which 47.2% is direct State expenditure. The cost of running the NPRU can be viewed as being apportioned across all major programmes with the exception of "Provision of Policy Advice on the Pig Industry".

Table 1: Expenditure and funds sources for major Departmental programmes for the Pig Industry

PROGRAMME	FTE DISTRIBUTION	EXPENDITURE ($'000 per annum)					SOURCE OF FUNDS ($'000 per annum)		
		SALARY and WAGES		OPERATING		TOTAL EXPENDITURE	INCOME	STATE FUNDS	NON-STATE FUNDS
		STATE	NON-STATE	STATE	NON-STATE				
1. HEALTH	3.2	56.9	69.3	6.9	47.5	180.6	18.0	63.8	98.8
2. GENETICS	1.9	11.6	60.0	1.8	16.0	89.4	24.0	13.4	52.0
3. NUTRITION	2.5	89.1	-	5.6	16.2	110.9	10.4	94.7	5.8
4. MANAGEMENT	1.3	48.4	-	3.2	5.8	57.4	0.2	51.6	5.6
5. REPRODUCTION	1.3	42.1	-	3.5	-	45.6	-	45.6	-
6. PIG MEAT QUALITY	1.0	36.9	-	2.5	-	39.4	-	39.4	-
7. POLICY ADVICE	0.5	20.3	-	1.0	-	21.3	-	21.3	-
8. NPRU OPERATIONS	2.6	78.7	-	16.0	106.0	200.7	85.0	94.7	21.0
TOTAL	14.3	384.0	129.3	40.5	191.5	745.3	137.6	424.5	183.2

Table 2: Analysis, by programme, of expenditure on major Departmental programmes for the Pig Industry

PROGRAMME	ANNUAL EXPENDITURE ($'000)	PERCENT OF TOTAL EXPENDITURE	PERCENT OF STATE EXPENDITURE ON PROGRAMME	PERCENT OF NON-STATE EXPENDITURE ON PROGRAMME
1. HEALTH	180.6	24.2	35.3	64.7
2. GENETICS	89.4	12.0	15.0	85.0
3. NUTRITION	110.9	14.9	85.4	14.6
4. MANAGEMENT	57.4	7.7	89.9	10.1
5. REPRODUCTION	45.6	6.1	100.0	-
6. PIG MEAT QUALITY	39.4	5.3	100.0	-
7. POLICY ADVICE	21.3	2.9	100.0	-
8. NPRU OPERATIONS	200.7	26.9	47.2	52.8

1.6 RECOMMENDED FUTURE STRATEGIES

Pig health programme:

There should be continued emphasis on herd health monitoring both at slaughter and on-farm through the PHMS and by developing on-farm programmes using accurate techniques for the diagnosis, monitoring and investigation of health and production.

Research activities should continue to concentrate on economically important and emerging disease problems capable of causing significant morbidity and/or mortality.

Strategies for the establishment and maintenance of high health status herds, e.g. medicated early weaning, should be investigated.

The need for regulatory disease control should decline. The investment in exotic disease preparedness for the pig industry should be maintained.

Pig genetics improvement and breeding programme:

There should be continued emphasis on this programme which incorporates pig breeding and genetic improvement programmes, particularly at an extension level. There should be continued support for the S.A. Pig Improvement Programme, which now operates on 40 farms.

The more accurate genetic selection programme, PIGBLUP, should be offered as part of the S.A. Pig Improvement Programme to identify and select superior breeding stock.

Pig nutrition programme:

Nutrition programmes should accommodate market-driven industry trends towards heavier, leaner pig carcases.

Programmes for the development and/or utilization of primary and potential feed ingredients should be maintained. Availability of the feed formulation service should be maintained.

The Department should obtain and evaluate the use of the pig production optimisation model, AUSPIG, with a view to offering this programme as a service to S.A. pig producers.

Pig management and producer training programme:

Producer training

The proposal for national specialists in areas of pig industry need should be strongly supported, for example in the area of training and education of piggery staff and managers.

Increased emphasis should be placed on on-farm staff training by Departmental officers in the future. Current group extension methods should be supplemented with producer workshops.

Housing and equipment research

The Department of Agriculture should have only limited involvement in this area, acting as a means of demonstration and/or evaluation of equipment and housing options for the local industry and for extension. The use of consultants and national expertise in areas of housing, equipment and environmental control should be encouraged.

Effluent management

The management of piggery effluent is an important environmental issue for the pig industry. Greater emphasis should be placed on research and extension of techniques of effluent handling and utilisation.

Pig reproductive performance programme:

A significantly increased emphasis should be placed on this programme. This should be in all areas, with particular emphasis on extension.

Use of efficient breeding systems, involving use of cross-bred sows, should be encouraged in the industry.

Piggery staff training programmes should emphasise reproductive efficiency; workshops should be conducted to raise the knowledge of staff of the technical aspects of reproductive management.

Research in the area of new reproductive technologies will best proceed jointly with the University of Adelaide, with NPRU supplying the practical research facilities probably on a contractual basis.

Additional staff resources are needed in the reproductive area. External funding has been applied for from the Pig Research and Development Council which may address the research component of this deficiency.

Northfield Pig Research Unit Operations

The examination of joint development of pig research facilities between the Department of Agriculture and the University of Adelaide, located at the Roseworthy campus, is supported.

2. INTRODUCTION

2.1 THE COMMODITY PLANNING PROCESS

The South Australian Department of Agriculture has established Commodity Groups to prepare statements of current status and strategic plans covering the major agricultural commodities in the State.

The Pig Industry statement which follows summarises the characteristics of pig farming systems, production statistics, regional features, market outlets, both domestic and export, regulations governing the industry, and aspects of the abattoir and processing sectors of the industry.

The likely future potential for the industry and its market opportunities are assessed. Barriers to the achievement of this potential are then examined.

Current Departmental research, extension and industry service programmes are considered against the perceived barriers to industry progress in order to identify strategies for the future provision of Departmental services to the pig industry.

2.2 ROLE OF THE PIG COMMODITY GROUP

The Pig Commodity Group's role is to define, in conjunction with the pig industry, the future outcomes desired of Departmental services to the pig industry, to identify appropriate programmes and their funding and to conduct on-going review and evaluation of Departmental programmes.

2.3 MEMBERSHIP OF THE PIG COMMODITY GROUP

Dr. S. Pell, Chief, Animal Research Branch (Chairman)

Dr. B. Wilson, Director of Animal Industries and Analytical Services (Overview Director)

Departmental
Members:

Mr. G. Pope, Senior Pig Officer (Executive Officer)

Dr. C. Cargill, Veterinary Research Officer (Pigs)

Dr. P. Davies, Senior Veterinary Officer (Pigs)

Mr. R. L. Davies, Senior Research Officer

Mr. H. Hanna, Principal Officer (Meat)

Mr. J. Hargreaves, Senior Pig Officer

Mr. K. Jervois, Senior Agricultural Economist

Industry
Members:

Mr. R. Lienert) U.F. & S.; Commercial
Mr. A. Mosel) Pig Section representatives
Mr. S. Murray Advisory Board of Agriculture representative

3. INDUSTRY STATEMENT

3.1 FARMING SYSTEM CHARACTERISTICS

Pig production is a highly specialised intensive industry requiring relatively large capital investment per animal, with the majority of stock bred and reared indoors, in sophisticated shedding, and fed cereal based diets.

The basis of the industry is the medium sized, efficient, family unit with from 50-200 sows. Very large units exist, usually as highly integrated corporations.

In South Australia, the two largest such corporations are Metro Farms Pty. Ltd. with approximately 5,000 sows and G. Chapman Pty. Ltd. with around 3,500 sows. Total sow numbers in piggeries with 20-99 sows represent approximately 40% of the State's sow population, while sows in piggeries with more than 100 sows comprise approximately 30% of the population (not including Metro Farms and G. Chapman).

3.2 PRODUCTION

The Australian pig industry produced 4.9 million pigs for slaughter in the year to 30th June 1990 yielding 317,000 tonnes of pigmeat with a gross value of $629 million. Of this, South Australian slaughterings produced 40,800 tonnes of pigmeat with a gross value of $81 million.

Australian Bureau of Statistics (ABS) figures indicate that at 31st March, 1990, South Australia had 428,000 pigs, representing 16.2% of the Australian total of 2.65 million pigs. There are approximately 1,700 holdings with pigs in South Australia.

3.3 REGIONAL LOCATION FEATURES

The South Australian industry has tended to establish in rural, cereal growing districts relatively close to Adelaide. Major concentrations are north of Adelaide and in the Murray Bridge area, with lesser concentrations in the South East and on the Eyre and Yorke Peninsulas. It is estimated that 70% of all S.A. pigs are on units within 100 kms of Adelaide.

3.4 MARKET OUTLETS

Pig production is largely directed towards the domestic market. Australian pigmeat production, currently around 317,000 tonnes per annum, is estimated by the Australian Bureau of Agriculture and Resource Economics (ABARE) to rise to 370,000 tonnes per annum by 1994. Domestic consumption over the same period is projected to rise from 17.7 kg to 20.1 kg per person per annum.

Volume and value of exports have been limited to about 5% of gross value (7,500 tonnes, value $31 million, 1989). With the expected increase in domestic consumption, exports are expected to decline slightly to 6,000 tonnes, value $29 million, in 1994.

Export markets have been developed in Japan, U.S.A., Dubai, New Zealand, Papua New Guinea, Singapore and elsewhere. Asian markets are most likely to provide increased export potential in the future.

3.5 INDUSTRY REGULATION

There are some fourteen Federal and State Acts which directly or indirectly regulate the pig industry. Federal Acts include the Quarantine Act, the Agricultural and Veterinary Chemicals Act and the Export Orders relating to Meat and Livestock. State Acts include the Meat Hygiene Act, the Meat Inspection Act, the Agricultural Chemicals Act, the Stock Foods Act, the Stock Medicines Act, the Stock Diseases Act, the Swine Compensation Act, the Branding of Pigs Act, the Foot and Mouth Disease Eradication Fund Act and the Cruelty to Animals Act. There is, in addition, regulation relating to the protection of the environment and water resources, particularly in relation to disposal of pig effluent.

The general purposes of this weight of legislation are to ensure high standards of product quality to the consumer and to maintain the health status and welfare of the Australian pig herd.

Research is funded nationally from a producer levy on pigs slaughtered for human consumption under the Pig Slaughter Levy Act 1971 and the Pig Slaughter Levy Collection Act 1971. In South Australia, the S.A. Swine Compensation Advisory Fund also contributes substantial funding under the Swine Compensation Act.

3.6 THE ABATTOIR AND PROCESSING SECTORS

The abattoir and processing sectors range from large vertically integrated corporations down to small enterprises. Additionally there are the retail butchers who often undertake smallgoods preparation on their premises. The processing industry has traditionally been characterised by poor profitability, this being a major impediment to industry development and investment. (Cresap Report on the Australian Pork Industry, 1990.)

The S.A. Government has initiated a Strategic Industry Review of the meat processing industry. When completed the Review will provide advice to Government on how best to maximise the economic contributions of the meat processing industry in S.A. The related industry consultative group includes representatives from the pig producer, processing, wholesaling and smallgoods sectors.

The prepared meats industry across Australia is estimated to comprise more than 200 plants with an output value of $850 million per annum.

In South Australia, the major slaughter facilities are those of SAMCOR and G. Chapman Pty. Ltd. Smaller operations include Harvey Butchers Pty. Ltd. at Lobethal, L.V.S. Co. Pty. Ltd. at Angaston, Lincoln Bacon Specialists at Port Lincoln, Port Pirie Abattoirs Pty. Ltd and A. and M. Abdilla Meat Co. at Two Wells. Significant smallgoods operations include G. Chapman Pty. Ltd., Conroy's Smallgoods Pty. Ltd. and Garibaldi Smallgoods Manufacturers. A major meat wholesaler and exporter is Bran Trading Pty. Ltd.

There are large amounts of smallgoods imported from interstate into South Australia. The State is a net exporter of pigs, with approximately 45% of pigmeat from pigs grown in South Australia being consumed interstate.

4. INDUSTRY POTENTIAL

4.1 SUSTAINABLE PRODUCTION POTENTIAL

4.1.1 Potential exists for increases in both domestic and export markets for pigmeat and for production increases and improvements necessary to satisfy increased demand.

Projected expansions in the domestic market are documented in 3.4 above. Potential also exists for per capita increases in pigmeat consumption. Australians consume only 17 kg of pigmeat per person per annum compared with West Germany (55 kg), East Germany (63 kg), United States (31 kg) and Canada (29 kg).

4.1.2 Major production improvement potential exists in the areas of

- number of market pigs reared per sow per annum
- reduction in high mortality rates (particularly pre-weaning, still-born and non-viable pigs)
- improvements in feed efficiency, growth rate and carcase quality
- application of new technologies (e.g. genetic engineering) within the pig industry

Realisation of this potential will require improvements in the areas of pig management, genetics, nutrition, reproduction and disease control.

4.1.3 The Australian and South Australian pig industries are advantaged, relative to some other pig producing countries, by:-

- favourable feed prices (e.g. relatively cheap grains and grain legumes, grown locally)
- the high health status of the national herd (it is important that this position is maintained)
- a supply of relatively cheap rural land on which to build piggeries

4.2 MARKET OPPORTUNITIES

4.2.1 Major market opportunities, domestically and export-related, are linked to improvements in pigmeat quality. This will accompany the development of leaner strains of pig and of new technologies capable of influencing lean/fat ratios towards leaner carcases.

An "improved payment for quality" marketing scheme would provide greater incentive for the production of superior pigmeat.

4.2.2 Potential for increased pigmeat exports is covered in 3.4 above.

4.2.3 Specific challenges exist for the marketing of products of genetic engineering technology, for use of piggery effluent as a substitute for artificially manufactured fertiliser and for meeting the market requirements of ethnic groups in Australia.

4.2.4 A comprehensive document "Marketing opportunities for the Australian Pig Meat Industry" is being prepared by S. J. Rice and H. E. McClelland of this Department, summarising market opportunities available to the industry.

4.3 MARKET RETURNS

Saleyard prices for pigs are expected to remain largely unchanged as follows (ABARE estimates, Dec. 1990):-

Saleyard prices	90/91	91/92	92/93	93/94	94/95	95/96
Nominal (c/kg)	205	210	215	215	210	205
Real (in 90/91 dollars) (c/kg)	205	200	195	186	173	161

In the short term (1990-91), lower feed prices should result in improved profitability. However as feed grain prices recover, and real pig prices fall owing to increased competition from beef, the profitability of producing pigs is expected to decline in the medium term.

Retail prices for pigmeat are projected to increase at a slower rate than inflation in the medium term, at both saleyard and retail levels.

Retail prices	90/91	91/92	92/93	93/94	94/95	95/96
Nominal (c/kg)	689	716	744	767	786	806
Real (in 90/91 dollars) (c/kg)	689	682	675	662	646	632

5. BARRIERS TO ACHIEVEMENT OF INDUSTRY POTENTIAL

(In terms of priority, perceived very high priority issues are identified as ***; issues of high priority as **, while issues of lower priority, but still of importance, are identified as *).

5.1 *** VARIABLE PRODUCT QUALITY AND ASSOCIATION OF FATNESS WITH PIGMEAT BY MANY CONSUMERS

Poor quality, overfat, pigmeat is still produced by certain sectors of the industry. A proportion of consumers still associate fatness with pigmeat, thereby affecting product demand. There is a need for greater consistency in product quality across the industry.

There are ongoing problems with the techniques and equipment used in grading carcases on the kill-floor. Producer confidence in grading systems and the objectivity of quality/price differentials has been eroded over recent years. Packaging and presentation at the retail level are other aspects of perceived product quality requiring further developmental effort.

Issues of chemical residues in pigmeat are of concern and must be controlled.

5.2 *** LIMITED OPPORTUNITIES FOR THE EDUCATION AND TRAINING OF PIGGERY STAFF AND MANAGERS

The current shortage of suitably qualified staff within the industry, poor staff training, motivation and attitude are major barriers to increasing industry productivity.

The pig has an image problem, it lacks prestige. Appeal of the pig industry as a career opportunity needs to be raised.

5.3 ** DEMOGRAPHIC AND ENVIRONMENTAL ISSUES RELATING TO PIG KEEPING

The industry has increasing responsibilities for sound effluent management, particularly within areas of potential peri-urban land subdivision. Local government and environment groups are closely monitoring current and proposed industry expansion.

5.4 ** REPRODUCTIVE AND MORTALITY LEVELS IN THE INDUSTRY

The levels of sow reproductive performance and mortality (e.g. pre-weaning), particularly for smaller piggeries, are often behind those of competitive national pig industries (e.g. in Europe). The high prevalence of endemic production limiting diseases contributes substantially to suboptimal industry performance.

5.5 ** HIGH CAPITAL COSTS OF ESTABLISHMENT AND THE COST OF MONEY

5.6 ** INEFFICIENCY OF PROCESSING INDUSTRY

A number of recent studies have suggested that the cost of converting livestock into meat is unnecessarily high due to poor work practices and slow adoption of new technology.

5.7 ** RELIANCE ON THE DOMESTIC MARKET

Australian pigmeat is sold largely on the domestic market. The development of export markets has been limited by high processing, transport and wharfage costs and by lack of active, consistent marketing, supply and product quality and price. Further development of export markets for Australian pigmeat would be beneficial.

5.8 * ANIMAL WELFARE ISSUES

Compared to other countries, the Australian industry has faced less confrontation on these issues. The industry is conscious of the need to provide high welfare standards for its stock.

5.9 * GOVERNMENT REGULATION

While necessary for product quality, consumer protection and preservation of health status of the national herd, regulatory services need to be efficient and of minimum cost, consistent with effective service (e.g. in the Meat Inspection area).

5.10 * SHORTAGE OF INDUSTRY REPRESENTATIVES AT A POLITICAL LEVEL

The pig industry is represented through all levels of politics by the same (too) few motivated individuals.

5.11 * WATER QUALITY/QUANTITY

In various districts of the State, poor access to water of sufficient quality and/or quantity to support pig production limits opportunities for potential industry expansion.

5.12 * FERAL PIG POPULATION

The feral pig population would represent an obstacle to eradication in the event of an exotic disease outbreak. S.A., with the exception of Kangaroo Island, does not currently have a feral pig problem.

6. DEPARTMENTAL PROGRAMMES FOR THE PIG INDUSTRY

There are currently eight major Departmental programmes servicing the needs of the pig industry. They cover pig health, genetic improvement and breeding, nutrition, management and producer training, reproduction, pigmeat quality, provision of policy advice to the pig industry and operations of the NPRU.

Projects within each major programme are given below, together with statements of major objectives and expected outcomes.

6.1 PIG HEALTH

Major objective: To monitor, investigate and control diseases of significance to the South Australian pig industry.

Pig health research projects

6.1.1 ***Leptospirosis in pigs***

Expected outcome - the determination of the efficacy of vaccination in the control of leptospirosis

6.1.2 ***Streptococcus suis Type 2 infection in South Australia***

Expected outcome - the determination of herd prevalence of infection and of associated risk factors and the control of Streptococcus suis Type 2 infection

6.1.3 ***Investigation of sow infertility associated with post-mating vulval discharges***

Expected outcome - improved sow fertility via control of vulval discharge

6.1.4 ***Evaluation of the efficacy of artificial colostrum in reducing neonatal mortality of piglets***

Expected outcome - reduced piglet mortality, increased sales of artificial colostrum product

6.1.5 ***Effect of selenium and Vitamin E status on pig health and production***

Expected outcome - determination of selenium/Vitamin E status required to maximise production and avoid deficiency /disease situations

6.1.6 ***Investigation of the effect of immune response to a live oral E. Coli vaccine on response to subsequent immunisations***
(Contract research for Enterovax Pty. Ltd.)

Expected outcome - development of vaccines against E. coli diarrhoea

Pig health extension and industry service projects

6.1.7 *Pig Health Monitoring Scheme (PHMS)*

The PHMS provides a service of monitoring gross lesions in slaughtered pigs to provide objective information on the prevalence of economically significant diseases in pig herds. The scheme includes some 100 paying member herds and is partially trust funded. Information is provided in graphical form to producers and their consultants to assist with on-farm health management.

Expected outcome - improved health status, reduced losses and increased performance in the South Australian pig herd

6.1.8 *Investigation of the causes of stillborn pigs*

Expected outcome - determination of the causes of stillbirths and the development of management strategies to increase the number of pigs born alive and surviving to weaning.

6.1.9 *Investigate the bacteria that produce antibodies that cross-react with Actinobacillus pleuropneumoniae antigen.*

Expected outcome - To improve the specificity of serological tests used to monitor antibiotic programmes to control pleuropneumonia in herds.

6.1.10 *Investigation of the risk factors present in pig units that may precipitate cases of pleurisy in the herd.*

Expected outcome - determination of the risk factors involved in outbreaks of pleurisy in herds and the development of control and prevention programmes.

6.2 PIG GENETIC IMPROVEMENT AND BREEDING

Major objective: To improve the genetic quality of pigs in terms of feed conversion, growth rate, reproduction and lean meat yield.

Pig genetics extension and industry service projects

6.2.1 *South Australian Pig Improvement Programme (SAPIP)*

This service involves on-farm backfat and growth rate measurement of pigs and their selection as breeding stock and aims to achieve continuing genetic improvement in contributing herds.

It is intended to offer a more accurate method of identifying and selecting breeding animals. This is PIGBLUP, a sophisticated computer programme utilising information from the pigs on-test and all their known relatives to make more accurate predictions of genetic merit.

Expected outcome - selection of superior breeding stock and faster genetic improvement in the South Australian pig herd

6.2.2 *Assistance in the management and technical aspects of the South Australian Boar Test Centre (SABOR)*

Departmental staff assist in the provision of managerial and technical advice to the staff of the industry-funded boar test and semen supply centre.

Expected outcome - continued supply of boars and semen of proven genetic merit to pig producers, leading to improved performance and reduced costs of production

6.3 PIG NUTRITION

Major objective To improve the financial and physical efficiency of feeding the pig and to develop cost-effective management tools for the South Australian pig industry.

Pig nutrition research projects

6.3.1 *The effective use of a range of locally produced grain legumes as major protein supplements in South Australian pig rations*

6.3.2 *Nutrient and inhibitor variation in field peas*

6.3.3 *Narbon bean intake inhibitor*

6.3.4 *Digestible energy of naked and dehulled oats*

The *expected outcome* of the above group of projects is the characterisation of locally available feed materials and their usefulness in pig rations.

6.3.5 *Australian amino acid precision study*

Expected outcome - improved accuracy in amino acid analyses provided to the intensive animal industries nationally.

Pig nutrition extension and industry projects

6.3.6 *Least-cost ration formulation service*

Expected outcome - more economic use of available feed materials to meet pig nutrient requirements

6.3.7 *Feed and feed ingredient analytical services*

These services include both standard feed analyses (e.g. protein, mineral analyses) available through the State Chemical Laboratories and amino acid analyses available through the NPRU Amino Acid Analysis Service.

Expected outcome - more accurate definition and effective utilisation of feeds and feed ingredients.

6.4 PIG MANAGEMENT AND PRODUCER TRAINING

Major objective To improve producers' management skills and the adoption of appropriate technology.

Pig management research projects

6.4.1 *Equipment research - wet and dry ad lib feeding*

This project aims to determine the effectiveness of ad lib 'single space wet feeding' compared to 'traditional multiplace feeding' and 'single space dry feeding'.

Expected outcome - recommendations to producers on the relative merits of available feeding systems.

Pig management extension and industry service projects

6.4.2 *Pig Management Recording Service*

This service is a whole-herd recording and costing service, providing monthly feedback of pig and financial performance, detailed action lists and incorporating specific consultancy advice to each herd. Targets are set and progressive pig and financial performance are monitored against these. Shortly a sow-based recording service will be made available to the producer through the Department of Agriculture. This will include a consultancy service to analyse the data collected.

6.4.3 *Publication of "Pig Industry Newsletter"*

PIN is a major State publication for the SA pig industry. It presents items of current interest covering all aspects of pig production and industry matters. This is derived from all members of the Departmental pig group together with regular contributions from industry. Published quarterly, it is sent free to approximately 650 producers and associated trade members.

6.4.4 *Farm budgeting analyses*

Profitability analyses and cash-flow development budgets to monitor the establishment or changes to scale of a piggery. This service is used by potential and existing producers and by financial institutions.

Expected outcomes - better management decisions and improved physical and financial performance.

6.5 PIG REPRODUCTIVE PERFORMANCE

Major objective: To improve herd reproductive performance and to research, develop and encourage the adoption of new technologies in the reproductive area.

Pig reproduction research projects

6.5.1 ***Production and assessment of performance of transgenic pigs containing copies of a porcine growth hormone construct***

Expected outcome - production of transgenic pigs with defined production characteristics.

6.6 PIGMEAT QUALITY IMPROVEMENT

Major objective: To improve pig carcase quality according to consumer requirements and to monitor and reduce pesticide and antibiotic residues in pigmeat.

Pigmeat quality projects

Aspects of carcase quality improvement are components of a number of the above research, extension and industry service projects viz.: 6.1, 6.2, 6.3, and 6.4.

A major method of improving pigmeat quality will be a reliable method of measuring carcase quality attributes, relating these to price and passing the information back to producers. The Department of Agriculture can assist but the organisation responsible for this system is AUSMEAT.

6.6.1 ***Investigation into the managerial factors associated with the detection of antibacterial residues in pigs at slaughter in South Australia***

Expected outcome - significant reduction in the occurrence of residues in South Australian pig meats.

6.7 PROVISION OF POLICY ADVICE ON THE PIG INDUSTRY

Major objective: To provide advice to the Director-General of Agriculture and to the Minister of Agriculture on issues relating to the pig industry.

6.7.1 ***Policy advice on the pig industry***

Expected outcome - a more efficient, economic environment for the pig industry.

6.8 NORTHFIELD PIG RESEARCH UNIT OPERATIONS

Major objective: To manage the Northfield Pig Research Unit as an efficient resource for pig research and otherwise as a successful commercial pig production unit.

6.8.1 ***Northfield Pig Research Unit activities***

All Adelaide-based pig specialists are located at NPRU as a consolidated research, extension and industry service grouping to meet the needs of the South Australian pig industry. NPRU is also the operational base for the South Australian Pig Improvement Programme and the Pig Health Monitoring Scheme.

Facilities include Production, Physiology and Isolation units with associated laboratory and office accommodation. Full details are given in the Biennial Report to Pig Producers 1990.

7. RESOURCES ALLOCATED TO PIG INDUSTRY PROGRAMMES IN THE DEPARTMENT OF AGRICULTURE

7.1 RESOURCE ALLOCATION TO PIG INDUSTRY COMMODITY AREA

Resources allocated to the pig industry are concentrated at the Northfield Pig Research Unit (NPRU). All of the Adelaide based pig specialists are located at the NPRU. Regional extension officers are located at Murray Bridge (Murray Lands region) and Nuriootpa (Central Region).

Personnel resources comprise:

Research officers:	2.1	(1 Trust funded)
Technical officers:	3.7	(2.7 Trust funded)
Industry extension officers:	3	
Veterinary officer (pigs):	1	
NPRU staff:	4	
Policy/Management	0.5	

Facilities at the NPRU include a 50 sow breeding and production unit, a pig physiology laboratory unit and an isolation unit for disease research work. Full details of these facilities are given in the "Biennial Report to Pig Producers - Northfield Pig Research Unit, 1990".

The pig industry commodity area directly employs 14.3 staff, representing 1.9% of the 752 Departmental staff allocated to research, extension and health and industry regulation. In comparison, the value of pigmeat produced ($81 million) represents 3.2% of South Australia's gross value of agricultural production (1989-90).

The total annual direct expenditure in servicing the pig industry is calculated (Table 1) to be $745,300 (1990/91). This figure does not include Departmental administrative costs or general service costs associated with laboratory and regional support.

Table 1 lists, for each of the eight major Departmental programmes for the pig industry, the expenditure and sources of funds used. Expenditures comprise salaries/wages and operating expenditures from both State and non-State sources. Sources of funds comprise income, State funds and non-State funds.

The data in Table 1 indicates that of the total expenditure of $745,300 per annum, $513,300 (68.9%) is attributable to salaries and wages, while $232,000 (31.1%) is for operating expenses.

Of the total expenditure on salaries/wages, 74.8% is sourced from State sources, with 25.2% are from non-State sources.

Of the total expenditure on operating expenses, 17.5% is sourced from State sources, while 82.5% is from non-State sources.

The sources of funds used are comprised of income $137,600 (18.5%), State funds $424,500 (56.9%) and non-State funds $183,200 (24.6%).

Table 1: Expenditure and funds sources for major Departmental programmes for the Pig Industry

PROGRAMME	FTE DISTRIBUTION	EXPENDITURE ($'000 per annum)					SOURCE OF FUNDS ($'000 per annum)		
		SALARY and WAGES		OPERATING		TOTAL EXPENDITURE	INCOME	STATE FUNDS	NON-STATE FUNDS
		STATE	NON-STATE	STATE	NON-STATE				
1. HEALTH	3.2	56.9	69.3	6.9	47.5	180.6	18.0	63.8	98.8
2. GENETICS	1.9	11.6	60.0	1.8	16.0	89.4	24.0	13.4	52.0
3. NUTRITION	2.5	89.1	-	5.6	16.2	110.9	10.4	94.7	5.8
4. MANAGEMENT	1.3	48.4	-	3.2	5.8	57.4	0.2	51.6	5.6
5. REPRODUCTION	1.3	42.1	-	3.5	-	45.6	-	45.6	-
6. PIG MEAT QUALITY	1.0	36.9	-	2.5	-	39.4	-	39.4	-
7. POLICY ADVICE	0.5	20.3	-	1.0	-	21.3	-	21.3	-
8. NPRU OPERATIONS	2.6	78.7	-	16.0	106.0	200.7	85.0	94.7	21.0
TOTAL	14.3	384.0	129.3	40.5	191.5	745.3	137.6	424.5	183.2

Table 2: Analysis, by programme, of expenditure on major Departmental programmes for the Pig Industry

PROGRAMME	ANNUAL EXPENDITURE ($'000)	PERCENT OF TOTAL EXPENDITURE	PERCENT OF STATE EXPENDITURE ON PROGRAMME	PERCENT OF NON-STATE EXPENDITURE ON PROGRAMME
1. HEALTH	180.6	24.2	35.3	64.7
2. GENETICS	89.4	12.0	15.0	85.0
3. NUTRITION	110.9	14.9	85.4	14.6
4. MANAGEMENT	57.4	7.7	89.9	10.1
5. REPRODUCTION	45.6	6.1	100.0	-
6. PIG MEAT QUALITY	39.4	5.3	100.0	-
7. POLICY ADVICE	21.3	2.9	100.0	-
8. NPRU OPERATIONS	200.7	26.9	47.2	52.8

7.2 RESOURCES ALLOCATED TO INDIVIDUAL PROGRAMMES FOR THE PIG INDUSTRY

Table 2 gives an analysis of expenditure allocated to each of the eight major Departmental programmes identified earlier, 6.1 to 6.8. The analysis shows, for each programme, the percentage of total expenditure allocated to that programme. The expenditure on that programme is then split into that percentage provided from State funds and that from non-State sources.

Table 2 indicates that the majority of resources are currently allocated to the programmes of pig health, pig nutrition and pig genetic improvement and breeding. The programmes of pig management and producer training and of pig reproductive performance currently absorb relatively small amounts of resources allocated to pig industry programmes. The programmes, pig health and pig genetic improvement and breeding, receive the majority of their funding from non-State sources.

The cost of running Northfield Pig Research Unit activities approximates 26.9% of total resource use, of which 47.2% is direct State expenditure. The cost of running the NPRU can be viewed as being apportioned across all major programmes with the exception of "Provision of policy advice on the pig industry".

8. REVIEW OF DEPARTMENTAL PROGRAMMES FOR THE PIG INDUSTRY

8.1 REVIEW METHODOLOGY

Industry involvement in the commodity planning process and review has been provided via nominated representatives of the United Farmers and Stockowners (Commercial Pig Section) and the Advisory Board of Agriculture.

The Commodity Planning Group, including the above industry members, reviewed current Departmental programmes against the identified barriers to/opportunities for industry progress. Additional industry input was obtained via the Pig Liaison Committee, the forum for interchange between Department and industry on pig industry issues.

8.2 REVIEW OF CURRENT PROGRAMMES AGAINST INDUSTRY BARRIERS

As background to the discussion which follows, Table 3 links identified barriers to industry progress with relevant current Departmental programmes.

Table 3: Industry barriers (priorities) and relevant current Departmental programmes (asterisks indicate degree of priority viz: *** High; **Lower; *Least but still important)

BARRIER (PRIORITY)		PROGRAMMES
Variable product quality/ fatness (***)	6.1	Pig health programmes (research and PHMS)
	6.2	Pig genetic improvement and breeding programmes (SAPIP and SABOR)
	6.3	Nutritional programmes/ feed formulation and analytical services
	6.4	Pig management programme
Residues in pigmeat	6.6	Detection of antibacterial residues
Adequate training of piggery staff (***)	6.4	Pig management and producer training programmes (P.M.R.S.; P.I.N.; Farm budgeting analyses) Assistance with training courses (e.g. TAFE) and on-farm training
Reproductive performance (**)	6.5	Production and assessment of transgenic pigs
Mortality levels, particularly preweaning (**)	6.1	Pig health research programmes; Pig Health Monitoring Scheme
Demographic and environmental issues (**)	6.6	Monitor chemical residues in pigmeat
	6.7	Policy advice; liaison with local government, industry and environmental groups
High cost of establishment and cost of money (**)		-
Inefficiency of processing industry(**)	6.7	Policy advice
Reliance on domestic market (*)		"Marketing opportunities for the Australian pigmeat industry" in preparation
Animal welfare issues (*)	6.7	Policy advice; liaison with Animal Welfare Advisory Committee
Government regulation (*)	6.7	Policy advice on industry legislation
Shortage of industry representatives at a political level (*)		-
Water quality/quantity (*)		-
Feral pig population (*)		-

8.3 DISCUSSION OF AND RECOMMENDED FUTURE STRATEGIES FOR INDIVIDUAL PIG COMMODITY PROGRAMMES

8.3.1 Pig health programme

This programme is adequately resourced.

Recommendation: *There should be continued emphasis on herd health monitoring both at slaughter and on-farm through the PHMS and by developing on-farm programmes using accurate techniques for the diagnosis, monitoring and investigation of health and production.*

Research activities should continue to concentrate on economically important and emerging disease problems capable of causing significant morbidity and/or mortality.

Strategies for the establishment and maintenance of high health status herds eg. medicated early weaning, should be investigated.

The need for regulatory disease control should decline. The investment in exotic disease preparedness for the pig industry should be maintained.

8.3.2 Pig genetics improvement and pig breeding programme

This programme is adequately resourced.

Recommendation: *There should be continued emphasis on this programme which incorporates pig breeding and genetic improvement programmes, particularly at an extension level. There should be continued support for the existing SA Pig Improvement Programme which now operates on 40 farms. The more accurate genetic selection programme, PIGBLUP, should be offered as part of the SA. Pig Improvement Programme to identify and select superior breeding stock.*

8.3.3 Pig nutrition programme

This programme is adequately resourced.

Recommendation: *Nutrition programmes should accommodate market-driven industry trends towards heavier, leaner pig carcases.*

Programmes for the development and/or utilization of primary and potential feed ingredients should be maintained. Availability of the feed formulation service should be maintained.

The Department should obtain and evaluate the pig production optimisation model, AUSPIG, with a view to offering this programme as a service to S.A. pig producers.

8.3.4 Pig management and producer training programme

Aspects of this programme are considered to require greater attention, particularly those relating to the education and training of piggery staff and managers. It is important to avoid duplication of effort between the Department of Agriculture and the D,TAFE training programmes.

The recently suggested national approach to extension, as promoted by the Pig Research and Development Council, should be strongly supported. Provision of National Education specialists will be of benefit in raising standards of training and staff available to the industry.

Recommendation:

Producer training

The proposal for national specialists in areas of pig industry need should be strongly supported, for example in the area of training and education of piggery staff and managers.

Increased emphasis should be placed on on-farm staff training by Departmental officers in the future. Current group extension methods should be supplemented with producer workshops.

Housing and equipment research

The Department of Agriculture should have only limited involvement in this area, acting as a means of demonstration and/or evaluation of equipment and housing options for the local industry and for extension. The use of consultants and national expertise in areas of housing, equipment and environmental control should be encouraged.

Effluent management

The management of piggery effluent is an important environmental issue for the pig industry. Greater emphasis should be placed on research and extension of techniques of effluent handling and utilisation.

8.3.5 Pig reproductive performance programme

This programme is identified as being seriously under-resourced currently. Major economic importance attaches to the reproductive efficiency of the pig herd. Recent figures for the top third of herds in the Victorian pig management study showed 18.1 pigs reared per sow per year. By comparison, the top ten percent of herds in the United Kingdom Meat and Livestock Corporation survey reared 24.3 pigs per sow per year. Potential returns from technical and managerial improvements in reproductive efficiency are substantial.

The current Departmental expenditure on the Pig reproductive performance programme is only 6% of total expenditure on Pig Commodity programmes.

Recommendation: *A significantly increased emphasis should be placed on this programme. This should be in all areas, with particular emphasis on extension.*

Use of efficient breeding systems, involving use of cross-bred sows, should be encouraged in the industry.

Piggery staff training programmes should emphasise reproductive efficiency and workshops should be conducted to raise the knowledge of staff of the technical aspects of reproductive management.

Research in the area of new reproductive technologies will best proceed jointly with the University of Adelaide, with NPRU supplying the practical research facilities, probably on a contractual basis.

Additional staff resources are needed in the reproductive area. External funding has been applied for from the Pig Research and Development Council which may address the research component of this deficiency.

8.3.6 Pigmeat quality improvement programme

This programme is adequately resourced. In general, it is felt that the Australian Pork Corporation is the appropriate body to address issues of consumer attitudes and requirements concerning product quality, with AUSMEAT and AMLC addressing abattoir problems.

Current Departmental inputs to the important issue of ensuring pigmeat free of chemical residues is considered adequate, although export requirements may force a change.

8.3.7 Provision of policy advice on the pig industry

This area is currently adequately resourced.

8.3.8 Operations of the Northfield Pig Research Unit

The NPRU is an integral part of research services and the provision of specialist resources to the pig industry. It is currently adequately resourced. The NPRU will have to be relocated in the future, on vacation of the Northfield campus. There may be benefits in the development of replacement facilities jointly with the University of Adelaide.

Recommendation: *The examination of joint development of pig research facilities between the Department of Agriculture and the University of Adelaide, located at the Roseworthy campus, is supported.*

8.4 AREAS IN WHICH BARRIERS TO INDUSTRY PROGRESS ARE NOT ADDRESSED IN DETAIL BY DEPARTMENTAL PROGRAMMES

Of the barriers identified in Table 3, the following are not addressed in detail by current Departmental programmes:

8.4.1 Demographic and environmental issues

Many of these issues are handled by the Department of Environment and Planning or at local Government level (often following Victorian "Codes of Practice"). It is important that greater liaison between the Department of Agriculture, local Government authorities and industry representatives occur at an early stage of discussion of these issues.

8.4.2 High cost of establishment and cost of money

Largely outside Departmental influence.

8.4.3 Reliance on domestic market

Development of export markets nationally is the responsibility of the Australian Pork Corporation and of individual exporters. The Department needs to be aware of the requirements of export markets and to advise South Australian producers accordingly. A Departmental analysis "Marketing opportunities for the Australian pigmeat industry" is being prepared.

8.4.4 Animal welfare issues

The industry is committed to high standards of animal welfare. Using existing "Codes of Practice", the Department undertakes an extension/advisory role, supporting RSPCA and local government.

8.4.5 Government regulation

Regulation is necessary to ensure high standards of product quality to the consumer and to maintain the health status and welfare of the Australian pig herd. The review of AQIS and the questioning of the need for full-time meat inspectors in domestic abattoirs is supported.

8.4.6 Shortage of industry representatives at a political level

The valuable contributions of (too few) industry leaders is well recognised. To increase this number is a difficult problem and is unlikely to change with Departmental input.

8.4.7 Water quality/quantity

There is little scope for effective Departmental input in this area.

8.4.8 Feral pig population

While South Australia (except Kangaroo Island) currently does not have a feral pig problem, the industry must be kept informed of feral pig population migration southwards and attendant animal health ramifications. This is the responsibility of the Animal and Plant Control Commission.