BEFORE THE HEARINGS PANEL

AT THE MACKENZIE DISTRICT COUNCIL,

COUNCIL CHAMBERS, FAIRLIE.

IN THE MATTER	of the Resource Management Act 1991 ("**the Act**")
AND	
IN THE MATTER	of the hearing of submissions on Plan Change 23 and Plan Change 27 to the Mackenzie District Plan.

STATEMENT OF EXPERT EVIDENCE

OF IAN BARUGH

FOR NEW ZEALAND PORK INDUSTRY BOARD

(NZPork)

2nd May 2024

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SUMMARY STATEMENT

1. This statement of evidence addresses the submission of NZPork.

2. My evidence provides an explanation of the systems used in commercial pig farming operations in New Zealand and the Mackenzie District and the anticipated amenity effects of different pig farming systems.

3. Housing systems for pigs vary widely, ranging from indoor setups with controlled environments to outdoor systems providing access to paddocks and shelters. Indoor housing offers different styles of buildings with various insulation levels and ventilation systems, while outdoor setups can be classified into free farmed and free-range systems. Free farmed operations maintain an outdoor breeding herd with indoor housing for growing pigs, while free-range systems allow breeding sows and boars to live outdoors throughout their lives, with individual huts for farrowing. Each system has unique housing designs tailored to the pigs' needs, with stock densities reflecting differing management practices and environmental considerations.

4. Both indoor and outdoor pig farming systems exhibit distinct amenity effects, including odour, dust, noise, traffic generation, and built form. Odour is typically the most complained about amenity effect. Factors influencing odour differ between indoor and outdoor systems, with most odour issues arising from effluent storage and treatment.

5. My evidence also explains the need for on-site worker accommodation in pig farming operations. It is common practice for commercial pig farms to provide on-site housing for staff due to the labour-intensive nature of pig farming. Farrowing sows and weaner/grower pigs require regular feeding and care over a 24-hour period. Additionally, on-site staff accommodation enhances farm security and helps mitigate biosecurity risks, a significant concern in pig farming. Providing accommodation for farm staff is deemed a standard practice in commercial pig farming and aligns with the needs of other farming activities.

QUALIFICATIONS AND EXPERIENCE

6. My full name is Ian Barugh. I am the Technical Manager with NZPork and hold a Bachelor of Agricultural Science and a Diploma in Science.

7. I have been involved in the New Zealand pork industry for many years. Apart from time at University I have been continually involved in several roles in a practical manner and research in the New Zealand pork industry. These include:

    i. Working on and managing pork production/pig breeding units/boar test station (3 years).

    ii. As an on farm advisory officer/consultant, covering all aspects of pork production (husbandry, nutrition, management, building design, manure management, economics) (13 years)

    iii. Managing a pork procurement/marketing company (3 years).

iv. Current role as technical manager for 30 years providing technical support for the New Zealand Pork (NZPork), NZPork staff, pork producers, nutritionists, veterinarians, and other personnel servicing the pork industry. Key role has been in pork industry training, technology transfer and environmental support. I have delivered presentations and advice on all aspects of pork production with recent emphasis on welfare issues especially around housing systems for sows, integrating outdoor pigs into the nutrient budget Overseer, supplying technical information and topical issues affecting the pork industry to farmers.

NZPORK SUBMISSION

TYPES OF PIG FARMING SYSTEMS USED IN NEW ZEALAND

8. A wide range of farming and housing systems are used to raise pigs. Breeding units carry breeding sows, their replacements, and boars. The management of the breeding unit is on a regular weekly flow or batch system where at any time there will be gestating sows, sows about to be mated, boars, replacement gilts, and lactating sows and litters on hand.
9. Pigs weaned (known as weaners) from the breeder unit can move to a weaner/nursery facility on the same site or be sold or transferred to another farm. Newly weaned pigs remain in the nursery for up to 6 weeks and are then transferred to a grower/finisher facility where they are grown until point of sale at about 20 weeks of age. At each stage the housing, feed, environmental and husbandry needs are different, and this will determine the type of accommodation required to house pigs.

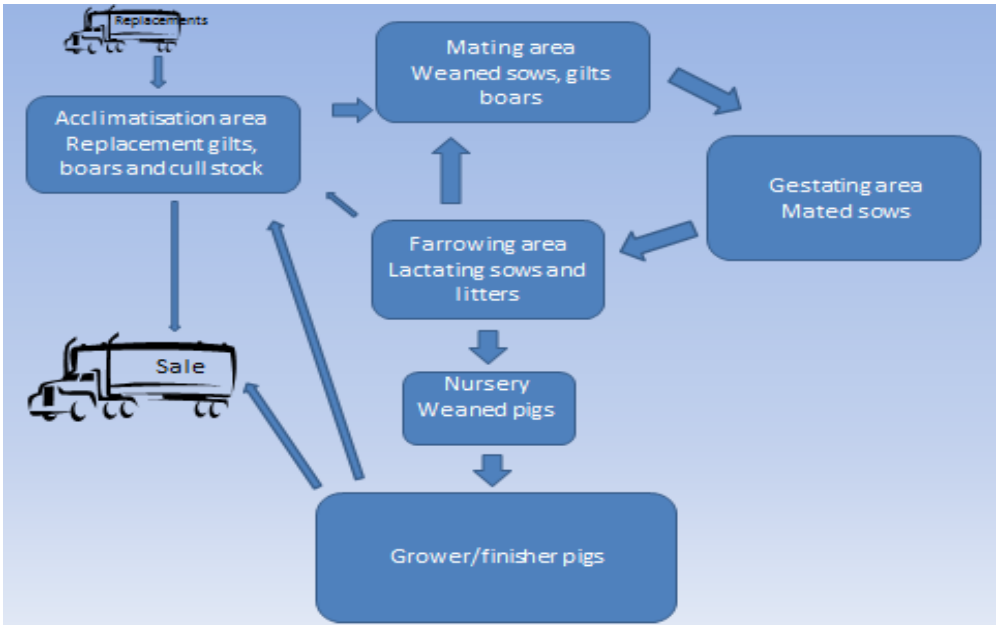

Figure 1: Schematic layout of a pig farm structure and pig flow

Types of housing systems

10. Indoor housing can consist of different styles of buildings, constructed from timber or steel framing with varying amounts of insulation. Walls can be constructed of concrete panels, concrete blocks, plywood and 'freezer panel' walls with corrugated iron or 'freezer panel' roof construction. Ventilation systems include fully enclosed controlled environments to more reliance on natural ventilation using curtains and roof vents. Pole barns, utility implement sheds or hooped framed shelters covered with a waterproof fabric are often used in conjunction with straw or sawdust bedding as a deep litter system. The different housing systems, have different systems used for manure collection, storage, and utilisation via application to land.

11. Pig farming systems can be broadly separated into two categories. Indoor pig farming and outdoor pig farming. Outdoor pig farming operates in fenced paddocks with a weatherproof hut or shelter available to protect the pigs and provide access to shade from direct sunlight.

12. Outdoor pig farming can then be further classified to 'free farmed' systems and 'free-range' systems. More detailed descriptions of each are given below.

Indoor systems:

13. During pregnancy sows are housed indoors all year around. They are housed in groups in environmentally controlled or naturally ventilated sheds.

Image 1: Indoor group housed dry sows.

14. Prior to farrowing or giving birth, they are transferred and housed individually in specialist facilities. These farrowing facilities are environmentally controlled, allow individual feeding and care, are easy to keep clean, designed to provide piglet

protection, and meet the different temperature requirements of the sow and her piglets.

Images 2 and 3 Sows and litters in indoor farrowing facilities

15. A variety of housing systems are used to house pigs after weaning. Pigs can thrive in diverse environments which provide shelter from the elements, space, and access to feed and water. As they grow their feed and temperature requirements are adjusted to meet their needs. Around 55% of New Zealand's commercial pig herd are farmed indoors.

Images 4 and 5: Indoor group housing for newly weaned pigs on straw bedding and growing pigs on a fully slatted floor.

Image 6: Growing pigs raised on sawdust bedding.

Outdoor Free Farmed systems:

16. Free farmed systems are those that have an outdoor-based breeding herd, and an indoor-based housing system on straw or sawdust bedding for growing pigs.

17. The breeding sows and boars live outdoors for their whole life, provided with housing in a variety of forms. The dry sow huts/shelters are designed to accommodate groups of breeding animals' dependant on the size of the farm and ability to be able to be shifted through gates. These come in a variety of forms as shown in the illustrations below. Note trees for shelter and the huts are facing away from the predominant wind direction.


Images,7,8,9 and 10: Examples of housing for outdoor dry sows

18. At farrowing time, the sows are moved to a separate area and give birth in individual huts, which they can move in and out of freely.
19. After weaning, pigs transferred and are raised indoors in open fronted shelters or barns with straw or sawdust bedding. Most outdoor pig farming operations in operate in this manner.
20. Stock densities for outdoor breeding herds are significantly lower than those typically associated with more intensive indoor farming systems. Stock density of outdoor breeding herds will vary between farms depending on the environmental conditions, and any regulatory requirements/controls, but in keeping with Good Management Practice can range between 17 – 32 sows/ha, or in other words, between 300m2 – 600m2 per breeding animal. In contrast, stock densities for indoor breeding herds on slatted floors in environmentally controlled sheds can be up to 5m² per breeding animal and 1 m² for indoor growing pigs up to 100kg liveweight.

Outdoor Sow combinations

21. Other combinations occur with sows farrowing outdoor, gestation indoors and post weaning growers are reared in environmentally controlled sheds.

Image 11: Outdoor breeding herd on a free-farmed operation.

Image 12: Sow and litter in outdoor farrowing paddocks. Movable farrowing huts are visible in the rear of the photo.

Outdoor Free-range systems:

22. In free-range systems, breeding sows and boars live outdoors for their whole life, provided with shelter and protection from the elements. The sows give birth in individual huts, which they can move in and out of freely. Newly weaned pigs may be kept for a short period in a fenced outdoor pen with a shelter, before they are fully transitioned for rearing outdoors during the grower-finisher period provided with huts for shelter. Less than 5% of New Zealand's commercial pig herd is farmed in free-range systems.

ANTICIPATED AMENITY EFFECTS OF DIFFERENT PIG FARMING SYSTEMS

23. Indoor and outdoor pig farming systems will produce different levels and types of amenity effects, including odour, dust, noise, traffic generation and built form.

24. Odour is the most commonly complained about amenity impact from commercial pig farming systems. Most odour complaints referred to commercial pig farmers from neighbouring properties arise from effluent storage, treatment and reuse, rather than from the animals themselves. These issues can be addressed through a range of strategies including regularly flushing and cleaning of sheds, direct injection of manure to soil, low spray height, avoiding aerosols from high pressure sprayers, discharging in favourable wind conditions and strategic use of wind breaks. In an outdoor environment, pig manure is deposited directly to pasture, as in other pastoral farming systems. There is no accumulation, storage or treatment of manure from these areas.

25. Table 1 identifies the principal factors influencing odour from piggery operations in both indoor and outdoor systems.

Factor	Indoor	Outdoor
Effect of diet on odour	Feed composition is closely matched to pig's nutritional requirements, especially protein to minimise the amount of odour precursors subject to anaerobic decomposition of protein in the manure. This means 2 or more and appropriate diets and feed levels for the physiological (reproductive) states of animal e.g. separate gestation diet and lactating diet and for growing pigs separate weaner, grower and finisher diets.	Feed composition is closely matched to pig's nutritional requirements, especially protein to minimise the amount of odour precursors subject to anaerobic decomposition of protein in the manure. This means 2 or more and appropriate diets and feed levels for the physiological (reproductive) states of animal e.g. separate gestation diet and lactating diet and for growing pigs separate weaner, grower and finisher diets.
Manure Storage	Increased odour emissions expected when handling stored manure	Does not occur
Solid Separation	Increased odour emissions expected when handling separated solids	Does not occur
Slurry storage	Increased odour emissions expected when handling stored slurry. Only stir slurry when emptying sumps or ponds	Does not occur
Slurry drains/pipes	Where possible have covered sumps or pits and use pipes rather than open drains.	Does not occur
Cleanliness of yard and raceway areas	Manure on yards and raceways following stock handling and moving, hosed away directly on completion.	Does not occur in paddocks
Housing and Management	Ventilation systems designed for correct air flow to prevent build-up of odours. All pens and stock checked for cleanliness on a daily basis. All pens cleaned	Pigs rotated around clean paddocks. Ground cover maintained. Feed wastage removed. Stocking density is very light compared to Welfare Code requirements.

	between batches. Potential odorous spillages such as feed and manure cleaned up immediately. Stocking density maintained at or below those in Welfare Code	
Under slats	Flushed out regularly	Does not occur
Pull plug pits	Flushed at a time to minimise transfer of odorous emissions	Does not occur
Spreading manure to land	Spread at a time to incorporate into crops. Spread with a favourable wind direction	Does not occur. Pigs deposit dung and urine daily
Spreading of slurry to land	Spread at a time when plants utilise nutrients. Spread with a favourable wind direction. Use low trajectory splash plate or irrigator. Spreading at a time of favourable weather forecast.	Does not occur
Feed storage	Dry feeds and feed ingredients all stored in covered bins and hoppers.	Dry feeds and feed ingredients all stored in covered bins and hoppers.

Table 1: Principal factors influencing odour from piggery operations.

26. Other amenity effects and mitigations are as follows:

    a. Dust: Dust is more likely to be an issue in outdoor piggery systems. Strategies for managing dust on an outdoor piggery operation include ensuring maintenance of groundcover to prevent bare ground (which may involve adjusting stocking rates and resting paddocks when necessary), nose ringing of sows to prevent rooting, and the strategic use of shelter belts around outdoor pig paddocks.

    b. Noise: At GMP stocking densities on outdoor operations, noise should not be a significant issue. Noise from animals will be minimal, and noise from machinery will be similar to that of other pastoral farming systems, with vehicles and tractors used regularly for feeding out and other regular on-farm maintenance and scheduled activities such as moving farrowing huts.

    c. Traffic generation: the traffic generation will be standard across the piggery. Stock trucks typically arrive weekly to take market-ready grower pigs for processing.

Feed delivery trucks and staff travelling to and from work would also generate regular traffic movements.

d. Built form: Indoor systems will have one or more housing sheds, which can be large in size. Farrowing huts are the only structure present in outdoor breeding herd paddocks. They are low to ground, sparse and visually unobtrusive. Refer to image 4

FARM STAFF ACCOMMODATION

27. Finally, I have been asked to provide some evidence on the need for farm staff accommodation on site as part of commercial pig farming operations.

28. Like all farming activities, whether a commercial pig farmer requires staff accommodation on-site will depend on several factors including the scale of the operation, its location, and management structure.

29. However, in my experience it is usual for commercial pig farms to house staff on-site for several reasons:

    a. Animal husbandry – commercial pig farming is labour intensive. Farrowing sows and weaner/grower pigs require regular feeding and care over a 24-hour period. Indoor operations require staff available at all times to monitor and maintain building temperature, ventilation systems, effluent management provide for the welfare of pigs and other processes.

    b. Farm security

    c. Biosecurity – biosecurity is a significant risk factor for commercial pig farming and some operators prefer staff to live on-site to help reduce biosecurity risks, particularly the risk of people living on or near other properties that keep pigs.

30. In my view, it is a normal part of commercial pig farming and other farming activities to be able to provide farm staff with accommodation on-site.

Ian Barugh

2nd May 2024.