The changing face of dairy in Victoria – are we ready for it?

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Short title
Planning and development of intensive dairy

Abstract
The last 5 years has seen unprecedented growth and development of intensive dairy production systems in Victoria. In these systems cows are permanently confined to sheds with their feed supplied as a total mixed ration. This is creating challenges for dairy farmers, local governments and the industry in the area of land-use planning. We examined current land use planning provisions and industry guidelines for their applicability and suitability to the implementation of intensive dairy production operations in Victoria. The majority of the legislations examined pose no issues to the development of large scale intensive dairy operations, however there are some aspects that do, or have the potential to, create confusion and difficulties particularly in the area of planning. New animal production definitions under the land-use planning code provide an unequivocal definition for intensive dairy farms with the inclusion of their own specific category. Separation distances used for intensive dairy farms are prohibitive for development and are inconsistent with other intensive livestock industries. A code for intensive dairy farming is required and would provide the opportunity to generate data for sound research-based operational standards.

Keywords
buffer distances, amenity, odour, barns, freestalls

Introduction
Dairy farming in Victoria has traditionally been a low to medium cost (Doyle et al. 2000, Clark et al. 2013) pasture-based industry and currently accounts for around two thirds of Australia’s total milk production (Dairy Australia 2017a). Supplementation with concentrates, grain and byproducts occurs to varying extents across farms (Jacobs 2014, Wales and Kolver 2017), with the annual average fed currently amounting to around to 1.6 t DM/cow (Dairy Australia 2015a). Infrastructure, such as feed pads for feeding cows has become more common in the last 10 years (O’Keefe et al. 2010), and in the last five years significant investment in farm and resource assets has seen intensive dairy concepts progress to fully operational systems. Intensive animal production is a farming system where the animals are permanently confined to sheds or pens without the opportunity to graze, and with all of their feed supplied inside the enclosures. Intensive dairy production in Australia is usually carried out using one of two barn-based setups - freestalls or loose-housing on a bedded pack (Bewley et al. 2017) - with cows fed a total mixed ration.
Since 2015 Agriculture Victoria has undertaken discussions with at least 30 farmers and/or investors, mainly in the northern part of the state, who were proposing to develop a new intensive dairy farm, transition their current production system to one that is fully housed, or expand their already intensive operation. Although this number only comprises around 2% of dairy farms in the Murray Dairy Production region (Dairy Australia 2017a), it is likely to only be around half of the farms who are considering these systems (P. Wallace, Agriculture Victoria). Intensive systems are being considered across a range of herd sizes, with the majority so far encompassing 500-1,500 cows. Around 20% of the developments are being designed with multiple barns to house large (2000+) numbers of cows at a single site. These proposals, in total, are planned to house in excess of 40,000 cows, which is around 12% of the cows in the Murray Dairy region (Dairy Australia 2017a).

Our observations are that it has been a challenge for development proponents to obtain appropriate planning approvals due to inadequate industry codes and guidelines, and that lengthy delays in planning and increased mediation have brought several applications to a halt. Council planning departments often lack the technical knowledge of the dairy industry to enable them to deal with the complexity of the applications, and this is also exacerbated with planning controls that do not reflect current farming systems. As such, expertise outside of local government is often sought to assess the suitability of applications. To complicate the process further, large intensive dairy developments are attracting greater attention from community, environmental and animal welfare groups. Responding to these submissions requires extra resources from within the councils and may even result in development cases being referred to State Government level to determine the outcomes.

As an extension to a government commissioned review (AIAC 2016, DELWP 2017a) into how the planning system supports current animal industries we further investigated current legislations and industry guidelines with the aim of clearly identifying factors that have the potential to hinder the growth and expansion of existing dairy production systems into intensive animal husbandry businesses, and the establishment of new intensive dairy enterprises in Victoria.

Method
To undertake this review, Victorian regulations, guidelines and best management practices were examined to determine at what point, if any, they were a hindrance to the development of large intensive dairy operations. We also examined recommendations made by the Animal Industries Advisory Committee (AIAC) in their review of the role of the planning system in supporting the establishment and expansion of animal industries (AIAC 2016). Recommendations were then made as to which regulations, guidelines and best management practices required updating and what new information needed to be generated in order to provide clarity for those making and assessing planning submissions.

Results
There are many legislative Acts, at both State and Commonwealth level, and associated mandatory policies, provisions, regulations, codes and standards regulating the development of dairy farming enterprises in Australia (Table 1.). A review of these legislations showed that the majority present no hindrance to the development of larger scale intensive dairy operations in Victoria. However, there are some aspects that do, or have the potential to create confusion and difficulties,
particularly in the area of planning. These include: land use planning definitions, separation distances recommended for dairy operations, and the lack of an incorporated code of practice for intensive dairy farming.

**Table 1.** Acts of Parliament, associated policies and standards that are relevant to the planning and development of large, intensive dairy production operations in Victoria, Australia.

<table>
<thead>
<tr>
<th>Act/Policy</th>
<th>Relevant to Planning and Development</th>
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<tr>
<td>Aboriginal Heritage Act 2006</td>
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<td>Catchment &amp; Land Protection Act 1994</td>
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<td>Environment Protection Act 1970</td>
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<td>State Environment Protection Policy (Waters of Victoria) 2003</td>
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<td>State Environment Protection Policy (Groundwaters of Victoria) 1997</td>
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<td>State Environment Protection Policy (Prevention and Management of Contamination of Land) 2002</td>
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<td>State Environment Protection Policy (Air Quality Management) 2001</td>
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<td>Environment Protection (Scheduled Premises and Exemptions) Regulations 2017</td>
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<td>Noise from industry in regional Victoria (EPA*, 2011)</td>
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<td>Recommended separation distances for industrial residual air emissions (EPA, 2013)</td>
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<td>Environment Protection Biodiversity Act 1999</td>
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<td>Flora and Fauna Guarantee Act 1988</td>
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<td>Occupational Health and Safety Act 2004</td>
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<td>Occupational Health and Safety Regulations 2017</td>
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<td>Planning and Environment Act 1987</td>
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<td>Victoria Planning Provisions 2016</td>
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<td>Road Management Act 2004</td>
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<td>Water Act 1989</td>
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<td>Water (Irrigation Farm Dams) Act 2002</td>
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*EPA – Environmental Protection Authority

The main advisory publication suitable to assist with the planning and development of intensive dairy farms in Victoria is ‘Guidelines for Victorian Dairy Feedpads and Freestalls’ (O’Keefe et al. 2010). While this publication is suitable for guiding farm developments involving a permanent cow housing system, it has not been developed for systems requiring multiple free stall enclosures or barns on one site and it does not accommodate dairy feedlots.

**Discussion**

**Land Use Planning Definitions**

The use, development and protection of land in Victoria is governed by the policies and requirements set out in the Victoria Planning Provisions (VPP; DELWP 2016). Planning departments in local council and shire offices are responsible for administering the VPP and issuing planning permits for agricultural developments in their respective localities. The VPP includes a set of land use terms (clause 74) that describe potential uses or activities in relation to the land. These terms are linked to the need for planning permits so that activities or uses with greater potential for negative off-site
impacts on amenities, such as odour, noise and dust, have more controls placed on them. While the focus of off-site impacts in relation to land-use planning is around amenity for nearby land users, this does not remove the need for animal industries to adhere to the Environmental Protection Act (1970), which deals with land, air and water pollution, and Public Nuisance laws.

Until recently animal husbandry was dichotomously categorized, under the VPP, as either intensive or extensive based on the source of the feed (DELWP 2016). If the animals’ main food source was obtained by grazing plants grown on the land, then the husbandry was defined as extensive. Conversely, if most of the food for the animals was imported from outside the enclosures, it was defined as intensive animal husbandry. There were also specific definitions under the intensive category for beef cattle feedlots, broiler farms and piggeries, which are linked to the industries’ codes of practice. While this definition for intensive animal husbandry was ambiguous for many of the production systems and practices undertaken today on dairy farms, due to having no specific definition for ‘most of the food,’ it was suitable for the large, fully housed dairies that are the focus of this review.

From September 2018 new Animal Production definitions (DELWP and DEDJTR 2018) were enacted to remove the current ambiguity of classifying grazing and intensive animal enterprises. Extensive animal production will now be replaced with grazing animal production and is defined as ‘where the animals’ food is obtained by directly grazing, browsing or foraging plants growing on the land.’ The definition also allows for any level of supplementary feeding. Intensive animal production will now be defined as ‘where the animals’ food is imported from outside the immediate building, enclosure, paddock or pen.’ Grazing animal production is specifically excluded in the intensive animal production definition. Additionally, a specific category for Intensive Dairy farms has been created under the intensive animal production category. This definition is now unequivocal for large, fully housed dairies.

**Separation Distances**

An important aspect in the development of intensive animal operations is ensuring that there is an adequate distance from existing sensitive land uses, such as residential buildings, surface and ground water resources, and the farms property boundary for the protection of amenity and the environment. These distances are known as separation, or buffer, distances. Urban encroachment on livestock enterprises, particularly farms that are expanding or intensifying their operations, is resulting in increased conflicts between residents and farmers, highlighting the need for improved land use definitions and appropriate classifications of current livestock practices so that suitable separation distances are applied.

To assist with ensuring separation distances are adequate, the VPP instructs that planners consider the separation distances outlined in the Recommended Separation Distances for Industrial Residual Air Emissions (EPA 2013). These distances have been recommended to minimise off-site impacts arising from unintended, industry-generated odour and dust emissions. Stock feedlots are specified in these guidelines and are defined as ‘where animals are confined for the purpose of agricultural production; beef or dairy’. This definition is ambiguous depending on how the term ‘confined’ is applied to animal production operations.
The recommended separation distances for beef and dairy operations differ. For beef feedlots a separation distance is calculated by taking into account the design and management of the feedlot, the stocking density, the type of sensitive land use, the terrain characteristics and the vegetation cover (Victorian Feedlot Committee 1995). With this approach, the separation distance required for a town is calculated to be more than that for a single dwelling. For example, a 2,000-head beef feedlot may need to be around 3,000 m from a town (>2,000 people) but only 600 m from a single dwelling.

For dairy feedlots the recommended separation distance is 5,000 m for all sensitive land uses. Anecdotally both domestic and foreign dairy investors have identified this as a significant barrier to the development of new operations and the expansion of existing large dairy properties, particularly should they intend to shift into confined animal operations in the future. In current dairy farming locations there would be very few residences that have 5,000 m or more between them and another residence, making it extremely difficult to site large intensive dairy operations in these areas.

To address this issue, new methodology for the calculation of appropriate separation distances for intensive dairy farms is required. Ideally the method would be similar to that in the Victorian Code for Cattle Feedlots, allowing for some consistency between industries. There is no local data available to enable the modelling of odour generation and dispersion from intensive dairy farms and the different style of housing and thus the types and amounts of effluent generated in beef feedlots, means that data suitable for beef cattle feedlots may not be applicable to housed, intensive dairy operations. Investigation of odour emission data from intensive dairy operations overseas to assist with separation distance modelling for intensive dairies in Victoria is a logical starting point. An accepted and robust method for calculating separation distance for intensive dairies is required to add predictability and certainty to planning applications. It should also be noted that for separation distances to be effective in decision making they need to be given statutory effect (AIAC 2016).

**Industry Codes of Practice to Assist Planning Approval**

Piggeries, broiler farms and beef cattle feedlots have industry codes of practice incorporated under the VPP to facilitate design, construction and operational standards in these intensive animal industries under Victorian conditions (Code of Practice Piggeries 1992, Victorian Feedlot Committee 1995, Victorian Code for Broiler Farms 2009). These incorporated codes provide a more rigorous framework of accepted principles which enables the associated environmental and public amenity risks or impacts of these operations to be managed. The piggeries and cattle codes are currently under review to ensure they better reflect emerging farming systems and industry best practice, given these codes were developed over 20 years ago. There is currently no code for intensive dairy farming.

An industry code of practice for intensive dairy farming would provide all parties involved in the design, development, assessment and approval of intensive dairy farms with a clear set of standards and requirements that aim to mitigate environmental and social impacts (AIAC 2016). It would provide more certainty and consistency in the planning and assessment and approvals process for new developments and provide a structured basis for assessment and verification of the ongoing compliance with appropriate operational standards. The standards that form the basis of an intensive dairy code need to come from a sound research base. This provides an opportunity for the industry to identify significant gaps and inconsistencies in information and generate data that is
specific for its needs, for example odour emissions from dairy barns that will inform separation distance calculations.

Conclusions
While the changes to land use definitions will provide clarity for those involved in the planning and development of large intensive dairy farms, there needs to be a standard methodology developed for determining separation distances. The development of a code for intensive dairy farming would provide the opportunity to generate data that is specific to the industry’s needs, ensuring operational standards have a sound research base.

Acknowledgements
Funding was provided by the Victorian Department of Economic Development, Jobs, Transport and Resources.

References


Legislation

Environmental Protection Act 1970 (Vic)