Dairy tanker incidents: Why dairy is different

Contents

Australia's dairy industry

The dairy industry is a significant contributor to the Australian economy. IBISWorld's *Milk and Cream Processing in Australia* report found that we produce $4.3 billion and export around $621 million of milk annually.

Data from NTI's National Truck Accident Research Centre (NTARC) shows that, on average, dairy tankers are 2.4 times more likely to be involved in a crash than other freight transport types.

1.1 Dairy farms

Dairy Australia tells us there are approximately 5700 dairy farms in Australia. Location, access, loading facilities and production vary considerably from site to site. Further, cows' daily milk production can vary by ±10%, so schedulers and drivers do not know precisely how much milk they will take from each farm.

This variability makes it challenging for schedulers to ensure safety and efficiency without exceeding prescribed mass limits. Add in our changing weather patterns, and we have a varied and unpredictable transport category.

1.2 Roads and access

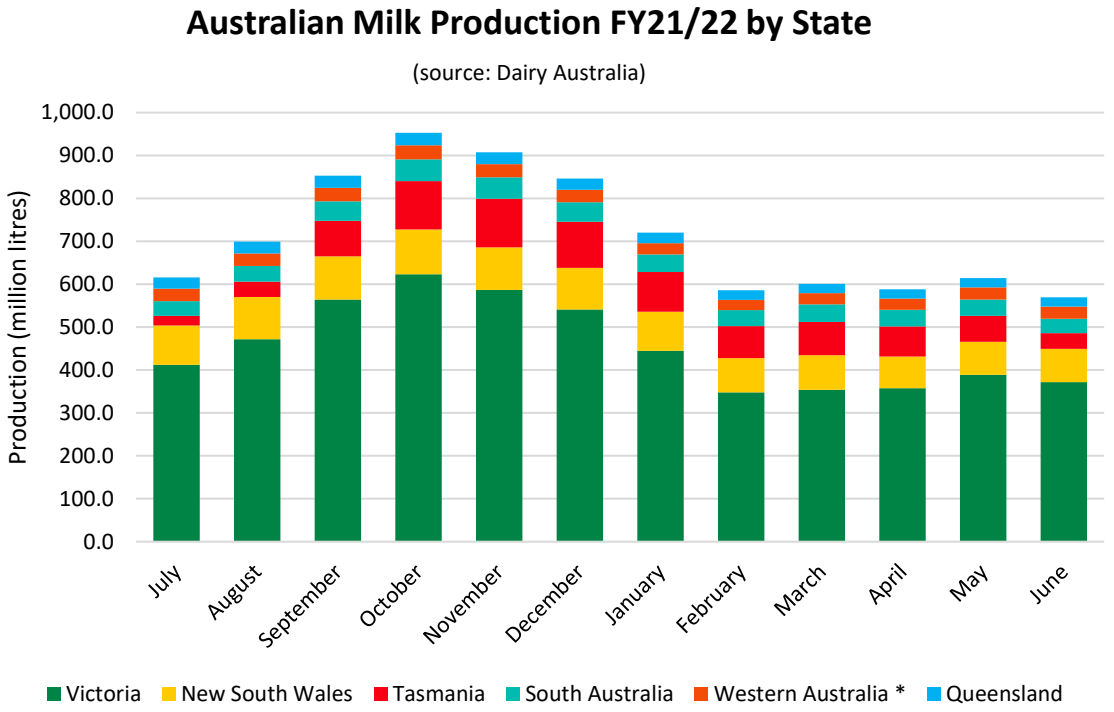
Dairy regions' road networks are typically narrow and winding, with sub-standard shoulders (often steep and typically in a poor state). These conditions add to the challenges of farm pick-ups.

Road and farm access conditions can limit the usable types and sizes of trucks. Many minor roads will not allow B-double or PBS vehicles access. To complicate this further, many farms on suitable B-double and PBS routes lack safe driveways for these combinations.

1.3 Seasonal variations

Milk production rates vary considerably due to seasonal factors, particularly in Australia's southeast. When rainfall is generous in early spring, high-quality grass is abundant. As a result, cows produce much more milk for a few months. Typically, production is highest in October–November.

During these peak times, permanent dairy tanker drivers' workloads increase, and operators may need seasonal drivers to meet demand, increasing crash risks.



Finally, milk can vary in weight, but it is inconsistent across locations, meaning that one farm's milk could be 2–3% heavier than another's. This variability adds to the challenge of predicting a milk tanker's dynamic behaviour in different loading conditions.

Vehicles

The milk cartage industry uses many vehicle combinations, operating on access and mass schemes that vary considerably across the fleet and its routes.

1.4 Vehicle types

6-axle semi-trailers

7, 8 and 9-axle B-doubles

PBS, A-double and PBS dog trailer combinations

The industry also employs an extensive range of prime movers from various manufacturers. These vary significantly in their 'driveability' and technology fit-outs. 'European' cab-over models are the most common, but bonneted 'American' models are still in the fleet.

Drivers in some areas change vehicles frequently, sometimes daily. They may not know what vehicle or combination they will be driving until they turn up at the depot. Each

time they do this, the stability and driveability of the combination are likely to be different to other vehicles, which increases the risk of an incident.

See the *Dairy Tanker Basics* book for more information on dairy tanker combinations.

1.5 Pick-ups and driving

In many regions, milk pick-ups happen 24 hours a day. Most transport companies have both day and night-shift drivers.

In coastal areas, early mornings and cold conditions can often mean fog. Fog can be difficult to predict or forecast; an unexpected foggy morning can wreak havoc on schedules.

Often farmers will close their gates to do the afternoon milking. This shut-down is usually in the second half of a day shift driver's shift.

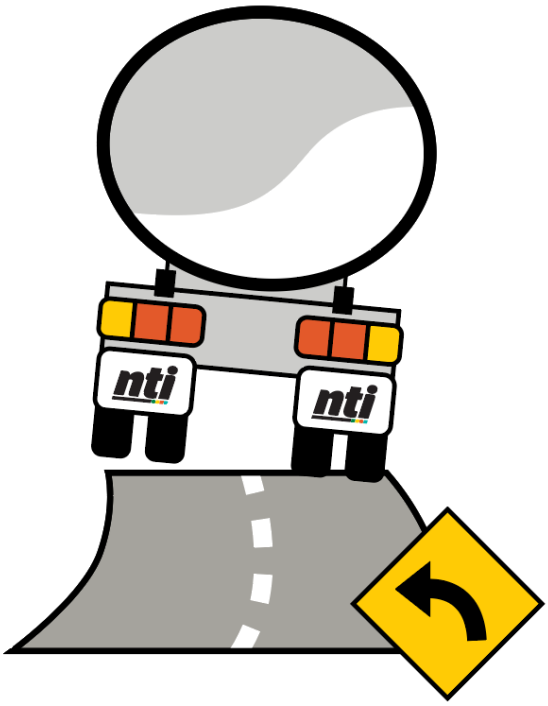
Drivers have reported that if they have a delay earlier in their day, they can be under pressure to get to a farm before it shuts down.

Drivers may pick up between 1000 and 15,000 litres at various farms on a typical run. This variability adds to the driving challenge as 'milk gain' – a tanker's increasing load at each farm – directly relates to a combination's stability and driveability.

Sloshing and surging present the greatest risks when tanks are 40–70% full. If a vehicle is in this load range and on a high-risk road section, it will be significantly more challenging for a driver to maintain control of their combination.

What NTARC's data tells us

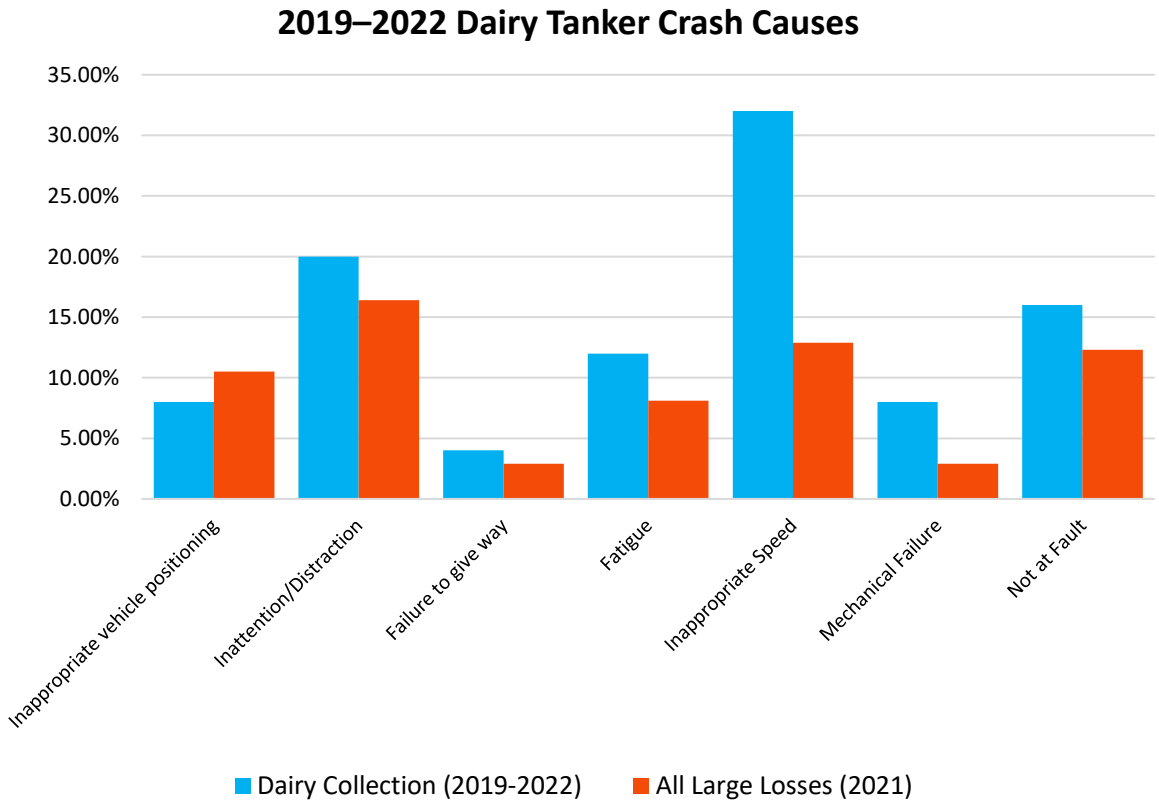
Reviewing NTI's data on major incidents (greater than $50,000 incident cost) to identify trends in incidents involving dairy tankers showed some critical differences between dairy tankers and all other unit types.



1.6 Inappropriate speed is the #1 cause

The most significant difference is the frequency of inappropriate speed crashes. These are predominantly single-vehicle 'untripped' rollover crashes.

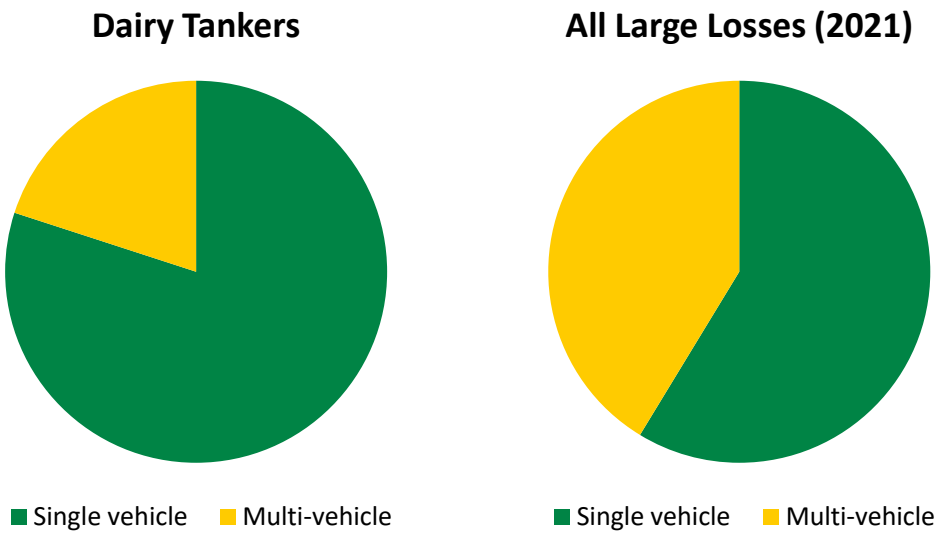
For dairy tankers, they represent one-third of all major incidents (32%) compared to one in eight for all unit types (13%).



Note: The plot above does not include all loss causes, so totals do not equal 100%.

1.7 Single-vehicle crashes dominate

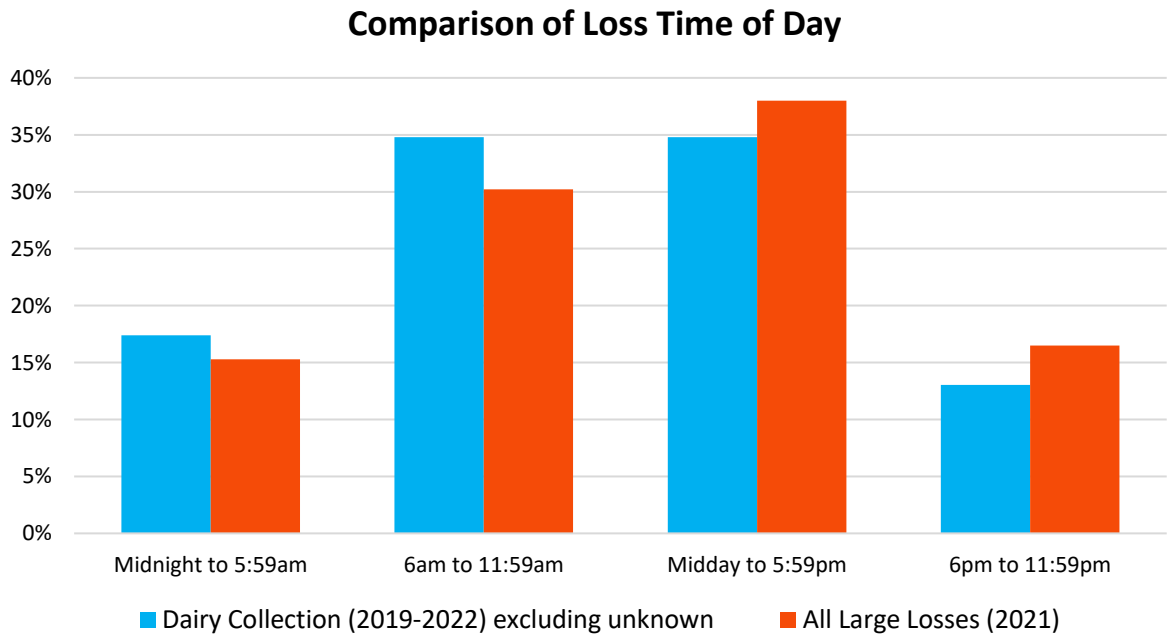
Another critical difference in the dairy tanker crash data is the proportion of single-vehicle crashes: 80% only involved the tanker, compared to 59% for all unit types.



This difference likely reflects tankers' operating environment, with lower traffic exposure than other freight tasks.

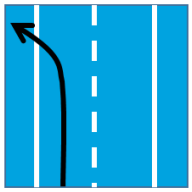
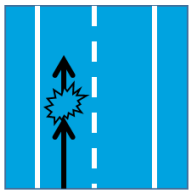
1.8 Crashes happen earlier in the day

Dairy tanker crashes skew earlier in the day than for other unit types. The difference is relatively small (around 2% more from midnight till 5:59 am and 5% more from 5:59 am till midday). This is likely because farm pick-ups also skew towards the first half of the day.



1.9 DCA categories

Finally, we reviewed incidents involving tankers by their coding against Definitions for Coding of Accidents (DCA). We found that 60% of crashes involved dairy tankers leaving the roadway on their own. The majority of incidents (88%) occurred on-road, with the remainder split between incidents occurring at pick-up (4% and delivery sites (8%).

Top 3 Dairy Tanker Incident DCA Categories			
Rank	**DCA Image**	**DCA Category**	**Percentage of crashes**
#1		Off path on curve	**36%**
#2		Off path on straight	**24%**
#3		Vehicles from same direction	**12%**

Conclusion

Dairy tankers crash differently to other unit types. NTARC's data show that the leading causes of single-vehicle untripped rollovers for dairy tankers are inappropriate speed (32%), inattention/distraction (20%) and not at fault (16%).

For other unit types, the leading causes are inattention/distraction (16%), inappropriate speed (13%) and not at fault (12%).

Note that the leading cause is 'inappropriate speed', not 'breaking the speed limit'. With highly dynamic loads, milk tankers can crash even at relatively low speeds.

Slosh, in particular, can elevate crash risk as it raises a tanker's centre of gravity and generates significant centrifugal force, pushing the tanker outwards on a curve. It is particularly dangerous when a tanker is around half full (40–70%) as the load has significant mass and room to move.

Schedulers and managers should consider dairy tankers' sensitivity to changing load dynamics and ensure they allow drivers enough time to safely pick up and transport their loads. Drivers should understand how slosh and surge affect their vehicles' and combinations' dynamics and **adjust their speed accordingly**.

References

C1131: Milk and Cream Processing in Australia. IBISWorld. April. 2022.

NTI NTARC *Major Crash Investigation 2022 Report*. Download from: https://www.nti.com.au/better-business-hub/ntarc/ntarc-2022-report

Dairy Australia. (2022). *National Milk Production November 2022*. Melbourne: Dairy Australia.

Dairy Australia. (2022, November 14). *Our Regions*. Retrieved from: https://www.dairy.com.au/our-industry-and-people/our-regions

Dairy Australia. *Australia's Dairy Regions*. (2022, January 16). Retrieved from: https://www.dairy.edu.au/resources/photo-resource/dairy-regions-of-australia

Dairy Tanker Basics. NTI. Download from: https://www.nti.com.au/better-business-hub/spilt-milk

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