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Position Paper - Wheat Dockage

The Japanese milling market is a key market for Australian grain and especially for the Australian noodle wheat industry. Noodle wheat sales into Japan are made through tenders operated by the Ministry of Agriculture, Forestry and Fisheries Japan (MAFF) on behalf of private flour millers. The Japanese Flour Millers Association (JFMA) represents these millers. Whilst considered an important market there are challenges for Australia's noodle wheat industry as outlined by AEGIC in its review of the [Western Australia's noodle wheat industry](#). A further challenge, the focus of this Position Paper is the reported increase over time of Dockage in Australian noodle wheat shipments into Japan.

The JFMA and the MAFF in 2018 signalled to the Grains Industry Association of Western Australia (GIWA) that the Dockage levels of Australia's Japanese noodle blend have been increasing over time and was becoming an issue.

Market requirements for Noodle (ANW) grades when exported from Western Australia to our primary customer base in Japan requires that a maximum of **0.5% Dockage is allowed**. The MAFF importing specifications for Dockage for its main suppliers are:

Table 1. Country Wheat Dockage Import Specifications

Country	US	US	US	Canada	Australia
Grade	WWW	HRW	NSDNS	CWRS	ASW Japan
Wheat Dockage Import Specification	0.3% max	0.3% max	0.3% max	0.5% max	0.5% max

Bulk wheat shipments purchased through the MAFF tender are disaggregated on arrival to individual mills that have purchased portions of the cargo. The Japanese Flour Millers Association (JFMA) laboratory and each individual milling customer measure the grain Dockage levels. Numerous and varied results are recorded. For example, one U.S. cargo in 2019 measured as .20% subsequently recording a Dockage level of 1.44% when tested at the mill. This may be due to the settling of chaff and other light Dockage material into pockets within the cargo when loaded and or during discharge or because of inconsistency in the Dockage measurement processes between the mills and the JFMA.

What is Wheat Dockage?

Dockage is dealt with differently across the world driven by inherent regional grain quality and for market reasons. In the USA wheat Dockage is described as weed seeds, weed stems, chaff, straw, or grain other than wheat, which can be readily removed from the wheat by the use of appropriate sieves and cleaning devices; also, underdeveloped, shrivelled and small pieces of wheat kernels removed in properly separating, properly rescreening, or recleaning. Wheat Dockage is measured by the use of a [Carter-Day Dockage Tester](#). The Carter-Day Dockage Tester utilises 1.62mm screens.

Australia does not refer to the term Dockage as used in other countries. Instead, the [GTA Grain Trading Standards](#) for wheat take an approach that any grain quality problems (like wheat Dockage) should have limits to **restrict these issues** from entering the post farm-gate supply chain. To accomplish this, the Australian system through the GTA Trading Standard Committee establishes grain trading specifications for Screenings (grain material which passes through a 2mm screen, including small foreign seeds) Unmillable Material above the screen and Objectional Material and Other Foreign Material.

The combination of Screenings, Unmillable Material above the screen, Objectional Material and Other Foreign Material can be considered specifications that **are similar to Dockage** in Canada and the USA. However, there are no restrictions on the delivery of Dockage in the USA and Canada as their systems have established other means to deal with Dockage. Each country approaches this differently.

Other Systems Methods to deal with Dockage.

Canada requires all export grain to undergo a ‘commercial clean’ to have Dockage removed. Export standards allow total foreign material of:

Table 2. Canadian Wheat Grades

Grade	Percentage Limit for Dockage
No. 1 Grade	0.4%
No. 2 Grade	0.75%
No. 3 Grade	1.25%

The US selectively chooses to clean grain to reduce dockage based on the level of dockage content of the grain the farmer delivers **compared to** the specific market requirement. For example, for export grain some destinations including Japan and South Korea will be delivered relatively low dockage levels as compared to less discerning markets. It is likely this is achieved through selection of low dockage grain where available combined with some country elevator and/or port cleaning processes.

Japan has been sharing data on Australian wheat Dockage tests conducted since 2017. Testing is performed on a composite of the entire cargo by the JFMA, and individual milling companies also share their recorded Dockage for each consignment.

Table 3 summarises wheat dockage level tests conducted on Australian cargoes.

Table 3. JFMA Dockage Aust Wheat Test Results

Australian Data 2017 to 2021	
Tests Conducted	117
Test Results above 0.5% Dockage	29
% Test Results above 0.5%	25%
Average Dockage % JFMA tests	0.40

Working Group Formed

To address the Japanese concerns an industry Working Group was formed to complete a thorough and holistic review of the incidence of Dockage in Australian Wheat. This group considered all aspects from seasonal and harvest conditions through to Grain Trading Standards and grain/grade blending practices.

It was noted there are a number of elements to wheat Dockage including ‘Unmillable’ and ‘Foreign Seeds’ (including ‘Small Foreign Seeds’) and any review and trial needed to consider the different elements. Harvester set-up and paddock weed seed management are elements considered. The review was satisfied that constant review and management is ongoing as a matter of course to maximise efficiency.

The Working Group also operated a number of trials involving the removal of any unmillable material (i.e., chaff) that collects on the face of grain stacks to determine if this has an impact on wheat Dockage as compared to other sites. Analysis of samples of grain into and out of stacks would also occur.

Trial Outcomes

The trial indicated there was no meaningful difference in the level of dockage from the trial sites as compared to non-trial sites and the **average dockage level at receipt in WA is within a range of 1 to 1.5%**. Post receipt and handling within the bulk supply chain the level of **dockage is reduced** with wheat Dockage in bulk shipments recorded in the range of **0.4% to 0.6%**.

Grain Cleaning Cost

Research in Wilson & Dahl 2001¹ established the capital cost in 2001 for a typical Canadian inland terminal cleaning operation range between US\$1.5 and US\$2.0million. Equivalent price today for a cleaning facility at a country located grain storage is **US\$2.05m to US\$3.35m**.

Wilson and Dahl also stated the cleaning of grain results in a **significant loss of the host grain/grade**. Based on their work and that of Prairie Horizons and JRG Consulting in 2001 the following updated Table estimates the \$/ per tonne cost for the cleaning to reduce the level of dockage in Wheat. This analysis indicates a range of cost **from \$4.50 to \$6.34 per tonne of grain cleaned**.

Table 4. Estimated Cleaning Cost per Tonne

	Country Store		Export Store	
	Canada	US	Canada	US
Average Fixed Cost 2001 c/tonne	18.4	146	18.4	33.1
Average Variable Cost 2001 c/tonne				
Variable Costs of Operations	37	48	77.2	55.1
Wheat Loss	132.3	69.8	158	99
Total Variable Cost UScents per tonne	169.3	117.8	235.2	154.1
Total US\$cost per tonne 2001	\$ 1.88	\$ 2.64	\$ 2.54	\$ 1.87
Total \$AUD 2001 equivalent	\$ 2.70	\$ 3.80	\$ 3.65	\$ 2.70
Cost \$AUD Adjusted 2022	\$ 4.51	\$ 6.34	\$ 6.10	\$ 4.50

Cost Benefit – What approach is preferred?

JFMA is seeking dockage levels at or below 0.5%. Australian grain is competing with other origin grain including North American grain. The North American grain may be ‘mechanically graded’ to remove dockage to achieve sub 0.5% Dockage levels for premium markets including Japan.

The Australian grain supply chain has not invested in grain cleaning equipment as Australia generally produces clean grain and also utilises limits in the GTA Trading Standards to minimise the incidence of high Dockage levels. There can be seasonal issues that result in increased Dockage in wheat.

Based on its review the Working Group consider the **cleaning of grain in Australia for this market may not be practical or commercially feasible due to the cost**.

The Working Group will continue to monitor the outcomes of wheat Dockage levels at points within the supply chain to ensure the requirements of the Japanese market are satisfied. This is important as in some seasons, seasonal factors may result in difficulty supplying the volume of wheat required by Japanese millers, within the varietal and quality parameters sought, below 0.5% Dockage levels.

¹ Evaluation of Changes in Grade Specifications for Dockage in Wheat, William W. Wilson, Bruce L. Dahl, 2001