Eliminating single-use plastics globally.

Keg Preparation

Hazard Analysis of Critical Control Points (HACCP)

HACCP analysis covering the receival, washing, sanitisation and storage of empty TUW kegs and lids for the purpose of filling and distribution by the customer.

Prepared for	TUW partner dairies
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Scope

This HACCP is inclusive of the receival, washing, sanitisation and storage of empty kegs and lids for the purpose of filling and distribution by the customer.

The scope is intended for the re-circulation of kegs for select customers only and should not be used for the introduction of newly formed kegs unless stipulated in the agreements.

It is noted that the customer takes all reasonable care in the filling process to prevent contamination.

HACCP team

Name	Position
Kurtis Tupangaia	Key Account Manager — key operator
Ed Crick	Managing Director & Founder
Aaron Haw	External support

Prerequisite programs

- **Good Manufacturing Process (GMP)** — monthly checklist identifying cleanliness, removal of waste, pest activity, floor surface integrity, removal of possible contaminants, equipment dis-repair, and access restrictions.
- **Pest management** — contracted out to minimise and where possible eliminate the presence of pests.
- **Process validation** — completed at high frequency at 1 ATP swab per sterilisation cycle in the initial stages, and now conducted at the start, middle and end of the day's processing using the Hygiena SystemSURE Plus rapid ATP monitoring system. Results are displayed as Relative Light Units (RLU). A result **greater than 10 RLU** is considered the highest point requiring subsequent swabbing and/or reprocessing before the batch is released. **TUW recommended operating target: under 3 RLU** — particularly where washing and filling occur at separate sites, where the additional transport and handling between wash and fill increases the margin needed to absorb any recontamination risk.
- **Preventative maintenance** — equipment is newly installed; this prerequisite is included in the GMP assessments.

Risk assessment methodology

A 5×5 risk matrix is used to assess the level of risk, taking into consideration the likely consequence and the likelihood of the hazards occurring.

Process flow diagram

Input	Process step	Output
Returned and new kegs	1. Receival of kegs and lids 2. Washing 3. Transfer & sanitisation 4. Draining	Prepared kegs for filling

Identified equipment

Equipment	Function
Rhima Australia RP-3 HR Pot & Utensil Washer	Alkaline wash using a non-caustic detergent (Typhoon) at **1.5 g/L**.
Rhima Australia RP-3 Pot & Utensil Washer	Acidic sanitisation using a peroxyacid (Oxysan) at **0.75 g/L**.

Manufacturer's report of temperature and dosing is to be maintained as validation.

Hazard analysis

Risk scoring uses a 5×5 matrix: Consequence 1–5, Likelihood A–E, Risk level 1–25. All process steps are listed below with hazard, cause, mitigation, risk score and control classification. Sanitisation (step 4) is classified as a Quality Control Point (QCP); no Critical Control Points (CCPs) are identified — see Conclusion.

Step	Hazard	Cause	Mitigation	Risk	Class
1. Receival	**Physical** — foreign material	Entrapped foreign material inside kegs.	Visual inspection before cleaning.	**3·C / 13**	—
1. Receival	**Physical** — broken / damaged kegs and lids	Damage during handling, transport & receival.	Visual inspection. For new kegs & lids: only permitted from approved vendors.	**3·C / 13**	—
1. Receival	**Chemical** — chemical residue	Customer wash and/or rinse residue.	Visual inspection before cleaning.	**2·C / 8**	—
2. Washing	**Bacteriological** — microbial growth	Milk residues inside the kegs are highly favourable for microbial growth.	Deep cleaning using validated procedure. Alkaline wash 65–70 °C. Total cycle time > 4 min. Sodium peroxide for biofilm removal.	**2·D / 12**	—
2. Washing	**Chemical** — chemical residue	Residues of wash chemical inside the kegs.	Sanitisation at high pressure and temperature (see step 4).	**3·C / 13**	—
3. Transfer to sanitisation	**Microbiological** — cross-contamination	Poor-quality air while moving kegs from low- to high-hygiene zone.	Environmental monitoring in place.	**2·D / 12**	—

Step	Hazard	Cause	Mitigation	Risk	Class
4. Sanitisation	**Microbial** — improper sanitisation	Insufficient concentration, or temperature not reached.	Validated cleaning procedure. Acidic treatment using peroxyacid at > 92 °C. Total cycle time > 4 min. Logged data.	4·B / 14	QCP
5. Draining	**Chemical** — sanitiser contamination	Pooling of residual sanitiser in kegs.	Inverted kegs and lids. Validated cleaning protocols.	3·C / 14	—
6. Transport to customer	**Microbiological** — cross-contamination	Contaminated air while moving kegs.	Lids applied to seal the units.	2·D / 12	—
6. Transport to customer	**Damage** — exposure of primary contact surface	Transport movements causing damage to empty kegs.	Wrap kegs tightly in transport.	4·A / 10	—

Reference material

- RP-3 & RP-3 HR Operator's Manual
- Rhima Australia Temperature Declaration
- Ecolab Oxysan CM® Data Sheet
- Dominant Australia Typhoon Data Sheet
- HACCP certification for the kegs and lids in combination
- Hygiena SystemSURE Plus operating manual

Conclusion

There are **no Critical Control Points (CCPs) identified** through this analysis. This is not to say that there are no risks associated with the receiving, washing and sanitising of the kegs, or the importance of the process.

The risks associated with the tasks identified in this scope are identified as **quality concerns** and most likely to present as spoilage / reduced shelf life, rather than as a food safety risk. Spoilage of milk is easily identified, as it produces a sour smell as the bacteria produce lactic acid. The smell will intensify after the milk becomes unsafe for consumption.

> It is expected that the customer receives the supplied equipment (kegs and lids) and integrates this plan into their own, formally accepting the empty kegs and identifying filling temperatures and processes as critical.