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Target Audience:

HSE Inspectors covering Manufacturing, Specialist Inspectors (Occupational Hygiene, Ergonomists, Medical, Occupational Health)

MUSCULOSKELETAL DISORDERS IN TRADITIONAL CHEESE MAKING

This SIM alerts inspectors to common MSD risks factors found during standard traditional cheese making processes.

BACKGROUND

1 The majority of the processes in traditional cheese making are carried out manually. Some employers believe that continuing to use manual processes is important to preserve the tradition and to allow them to call their product handmade. These employers may therefore require careful persuasion to introduce mechanisation and automation that can reduce MSD risks.

TRADITIONAL PROCESS AND ERGONOMICS ADVICE

Milk preparation

2 This process is unlikely to be associated with major MSD risks but lifting or moving of churns may be an issue.

Separating curds and whey

3 The unseparated mixture of curds and whey is poured into large open vats called coolers. The liquid whey is drained off by drawing the curd to the sides of the cooler leaving an open channel in the middle for the whey to drain down. The draining is often hand assisted and may involve the operator spending a significant time bending forward especially when reaching to the centre of the cooler. The repetitive hand movements may increase the risk of

ULD. Job sharing/enlargement and use of appropriate hand tool use will help to reduce risk.

Cheddaring

4 Cheddaring is the cutting and turning of the curds numerous times until they form soft rubbery blocks of approximately 3-5kg (weights vary greatly and can be as large as 8kg). This may require the operator spending significant time bending forward while lifting and turning the curd blocks.

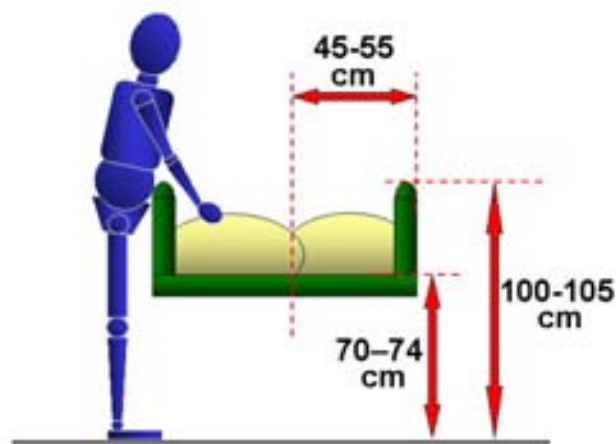
5 The height, depth and width of the cooler are important factors in minimising stooping during cheddaring.

6 The height of the rim of the cooler should be set at only slightly above the elbow height of the shorter male worker (960mm), approximately 1000mm-1050mm high. If the rim is higher it will make access awkward for shorter workers.

7 The base of the cooler should be at or only slightly below the hand height of the standing short workers (740mm) approximately 700 – 740mm from the floor. If it is less than this the taller workers will have difficulty reaching the bottom of the cooler leading to stooping and excessive lower back loading.

8 The width of the cooler should allow shorter workers to reach to the centre without bending too far forwards. The horizontal reach distance should not be more than 450mm to the centre of the cooler although a tolerance of +100mm may be necessary to enable a full vat of curds and whey to be emptied into a single cooler.

Figure 1 - Recommended dimensions of the cooler baths for cheese making activities.



Milling

9 On hand fed milling machines the curd blocks, weighing up to 5Kg, are lifted into the hopper for shredding.

10 Where possible the feeder to the milling machines should be kept below shoulder height and close to the edge of the cooler to minimise reaching away from the body while loading. Manual Handling Guidance (L23) suggests that one lift of 5kg every two minutes with two hands is reasonable. However, feeding the mill requires repetitive lifting over 12 times a minute and L23 suggests that with this repetition weights over just 1kg means an increased risk of injury.

11 Cutting the curd blocks into smaller sizes can reduce risk. Job rotation should also be considered, and the task of loading the milling machine shared with those who are mixing the cheese and salt immediately after milling, so reducing the risks to any individual.

Moulding

12 Cheese moulds are often stainless steel and can weigh up to 10kg. Lighter plastic moulds are available but there may be reluctance to replace the steel moulds due to the costs involved and the ease of cleaning stainless steel.

Mould Transfer

13 Full moulds weighing up to 40kg require to be moved to the cheese press.

14 Any means of avoiding manual transfer of such heavy weights should be considered and encouraged. Where moulds are manually handled, bending, twisting or other postural compromise should be minimised throughout the operation. This includes reaching forward away from the body while lifting the mould, stooping (for instance placing the mould on the floor or on a low mould press) or twisting. Team handling of all heavy moulds should be considered, as should mechanical aids such as trolleys and hoists. Heavier moulds should be fitted with suitable handles that allow two-handed (or, for heavier moulds, two person) lifting close to the worker's body. Carrying of full moulds should be absolutely minimised. As this is a high-risk activity a review of manual handling assessments and risk controls should always be made of this task.

Pressing

15 The pressing process may take up to 4 days during which the mould may be removed from the press on a daily basis to work on the cheese within the mould. Removal of the mould involves significant manual handling as mentioned above.

Extraction

16 The common method of removing cheese from the moulds is lift the full mould a few inches above the table and drop it onto a flat surface several times to loosen the cheese it contains. This is called “bumping out” and may be repeated several times before the cheese is released. Most of this action is performed using the arms and shoulders, assisted by the back muscles. When the mould weights are high (35-40kg) this action may result in high forces acting on the body and may cause muscles to make sudden contractions to support the shift of weight, which could result in a musculoskeletal injury.

17 Suggested means of risk reduction may include introducing a mould design that opens to release the cheese without any 'bumping out', or using other means of extracting the cheese, such as a mallet or hammer to loosen the cheese or a press to push the cheese out of the mould.

Processing

18 The cheese may be removed from the mould numerous times for processing, which includes scalding/washing the cheese, greasing it with fat, manipulating any gauze surrounding the cheese, etc. The removal of the cheese from the mould involves considerable manual handling and should be minimised by process changes wherever possible.

Turning

19 Cheeses are turned in the maturation stores once or twice each week until ready for sale, which may be months or years later. Stores are often cramped and workers' postures often compromised while turning the cheese. As well as the hazards of handling heavy cheeses and common poor postures, the work often involves a high degree of repetition and exposure. Job rotation or enlargement should be considered for reducing a single operator's exposure to this activity.

20 Lower and higher shelves should be filled with any smaller, lighter weight cheeses, with larger, heavier cheeses being stored around the waist/trunk height of the operators. Fork truck rack-handling systems or rotating stacking shelves are available to assist with cheese turning and vastly reduce MSD risks associated with this activity.

Cutting and Packing

21 Hand cutting can involve significant hand forces and high repetition, which are both risk factors related to upper limb disorders. The forces required to cut the cheese will depend on the properties of the cheese, but knife sharpness should be maintained and a management system to ensure this will decrease the likelihood of ULDs. The maintenance of proper posture while cutting the cheese will be aided by a well designed work bench with a

work surface set at about 200mm below the worker's elbow height or at approximately 800 – 850mm from floor level for a standing workstation.

22 Any enquiries should be made to Matthew Birtles, Ergonomist, VPN 524 8306.