

Stable work



Good practices in agriculture: social partners participation in the prevention of musculoskeletal disorders.

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Introduction

This brochure focuses on the many aspects of stable work that have to be performed. During several activities, awkward postures and movements are often necessary and may be difficult to perform without external assistance. These awkward postures and movements may lead to the development of musculoskeletal disorders: the back and upper limbs may be particularly vulnerable.

Moreover, unnecessary or avoidable stress whilst handling animals may also lower livestock productivity. Gentle quiet handling can reduce stress and should help to keep the animals calm. Calm animals are easier to manage than excited animals.

This brochure stable work is divided into several separate activities:

- Long-handled tools
- Distribution of bedding material
- Cleaning of feed mangers and aisles
- Removal of manure
- Feeding
- Working techniques

This brochure is based on farm visits across Sweden, Belgium, the Netherlands, Bulgaria and UK. These visits resulted in several good practices being observed to prevent or reduce the incidence of MSDs when performing stable work.

The brochure doesn't claim to cover all possible good practices to prevent against MSDs during livestock handling, but is the result farm visits and meetings with farmers. There is no affiliation to commercial organizations or products in presenting these good practices.

We would like to thank all farmers and agricultural workers that collaborated to this study and we hope that all other farmers might learn from their practices to prevent musculoskeletal disorders in the future!

1. Long-handled tools

Stable work involves a lot of manual operations. A first step to improve those operations is to invest in ergonomically well-designed tools.

There are many types of long-handled tool used in stables and livestock buildings for maintenance and cleaning tasks: scrapers, shovels, forks and brooms. Many of them are old-fashioned and are not necessarily suited for the work to be performed in modern designs of building and types of flooring. Also, the tools are not always adapted for the user, or adjustable, and therefore can increase the risk for musculoskeletal disorders in the upper limbs and the back, especially the lower back if the tools are used in a stooping posture.



Solution

Ergonomically designed tools



Ergonomic shaft tools

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Characteristics of ergonomically designed tools:

- *Specially shaped shafts to give more upright work postures (good for the back).*
- *Handles give better grips for the hands.*
- *Adjustable shaft lengths to enable workers of different statures to adopt good postures, thereby contributing to reduced workloads.*
- *Light-weight tools reduce the effort required to use them (hence the workload).*



2. Distribution of bedding material

The lying area must be provided with bedding material (straw, old hay, sawdust, peat and sand) to ensure the comfort of the animals. The distribution of the bedding is often done manually using a wheel barrow and a fork or a shovel. This manual work task often implies hard work load and awkward working postures which constitutes a risk factor for the development of MSDs.



Solution

Automated system on rails

Instead of manually distributing the bedding material, an automatic system on rails can be used.



Solutions

Machinery



Instead of manually distributing the bedding material, a small machine for bedding distribution can be used (left) or a machine where the distribution of bedding material is combined with cleaning/removal of small amounts of manure (right).

Cart



A cart is mounted on a front loader or tractor and so the bedding material is distributed without any heavy work load.

Solutions

Straw spreader



By using a straw spreader, manual handling becomes superfluous.



The machine takes the ballot and puts it in the spreader with telescopic arm. No manual manipulation necessary.

3. Cleaning of feed mangers and aisles

Daily cleaning of the stalls is necessary for hygiene reasons. Typically the farmer makes use of a brush or a shovel to clean up the barn. When brushing the worker is often in a stooping posture. Additionally, there may occur a rotation movement harmful to the spine. Moreover, the task becomes more difficult or arduous when the floor is irregular or rough.



Solution

Solution: mechanical scraper or brush



Solution

Mechanical brush



Using a mechanical brush enables the adoption of a better posture to perform necessary cleaning. Moreover, uncomfortable muscular exertion can be avoided by using such mechanical aids. However, the user may be exposed to possibly harmful whole body or hand / arm vibration, so it would be advisable to take advantage of appropriate protection, such as an air suspended seat or wearing soft leather gloves. For more information see <http://www.hse.gov.uk/pubns/indg296.pdf>

4. Removal of manure

Every day or twice a day the manure is manually removed from the lying and walking areas with a hand rake or a brush. This work task is time consuming and physical straining due to a twisted back.

Solution



Slatted floors



In the cow stable slatted floors can be found both in loose housing and stanchion barns.



Solutions

Moving barrier with water



The moving barrier is powered by water jets; the water carries away the manure (provided that the ground / floor is suitably contoured and drained). It is important that the water flow through each of the jets is appropriately adjusted.

Also, the gate must be centrally hinged and run on small wheels at the far end.

Machine for removal of manure



Automatic manure scraper



This blade design is ideal for large volumes of manure, especially with straw bedding. In addition, the V formation gathers the manure cleanly and keeps pushing big loads forward, without spilling any manure back into the clean alley.

Automatic manure robot



Automatic manure robot is suitable in loose housing dairy barns with slatted floors. The robot reduces the heavy manual work task to a minimum.

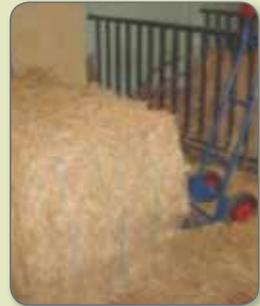
5. Feeding

Cattle may have to be fed several times a day, depending on the management system. According to the size of the herd, this task can be more or less physically demanding. In the worst case the farmer would carry numerous pails or buckets (or similar size containers) in order to feed the cattle.

Solutions

Hand truck

With the hand-truck a greater number of containers may be transported.



Agricultural Telescopic Wheel Loader

In case of larger herds, the use of a front-end loader (on a tractor) or a telescopic handler / teleporter (pictured) can be used to move bales (shown) or a large number of feed containers.



Solution for multiple containers

Hand cart / barrow



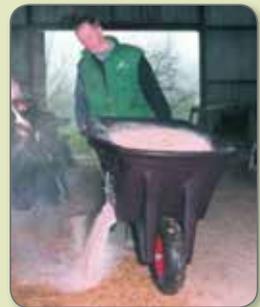
With a barrow it is possible to carry multiple containers on one run. Use of this tool also permits a better distribution of the total load.

However, beware that a heavily loaded barrow is likely to require large push and pull forces. An uneven floor or soft terrain would make the load even less easy to transport.

Solution

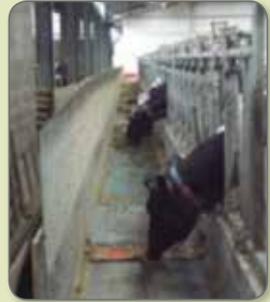
Wheelbarrow with distributor

Using a food distribution barrow helps avoid repetitive manual handling and /or shoveling actions / movements.



Solutions

Feed distributor



A conveyor-belt rolls forward and provides the food all along the feeding trough / manger.

Full automated feeding wagon



In the loose housing dairy barns the roughage can be distributed using full-automatic feeding wagons.

Partly automatic cart



Instead of manually distributing the food, a partly automatic cart can be used. This cart is mounted in a rail in the ceiling in the dairy stanchion barn. The worker just has to use the joystick to distribute the food. It is important to consider a distribution system that doesn't increase dust levels.

Problem: taking food out of a silo

Manual distribution of feed involves awkward positions caused by lifting or carrying the feed. This is also the case when using a wheelbarrow to take feed out of a silo.



Solution

Higher silo

By putting the silo higher, forward bending is not necessary anymore and an upright position of the body is better maintained.



Solutions

Feed mixer in combination with telehandler



By using a telescopic handler to take feed out of the silo, all manual handling can be avoided. The feed can then be placed in a feed mixer to be distributed.



Automated feeding system for grain and concentrate



Using an automatic feeding system makes the feeding relatively easy. Each animal is equipped with a transponder in its collar which makes it possible for the data system in the silo to recognize the animal and to provide it a predetermined ration. This enables the correct amount of feed to be dispensed to each animal without human involvement (except for the computer programming).

Feeding calves and lambs

5.1 Carrying milk

Buckets filled with milk are carried from the milk room to the calf sheds twice every day. One farmer explained: “One bucket contains 16 litres of milk and is sufficient to feed four calves. Having a herd of 60 calves and, assuming that each calf drinks about 360 litres of milk during its upbringing, it is necessary to carry about 21600 litres of milk per year – and this is a heavy work task”.



Solution

Milk cart



An attractive solution would be a milk cart. The cart contains 100-250 l of milk, has large rubber wheels and can be either manually drawn or electrically driven (with manual guidance). Also, the hand cart / barrow for multiple containers can be used in this situation (see previously).

5.2 Feeding calves

The task of feeding calves occurs twice a day and consists primarily of pouring fresh milk into a teat bucket. The teat buckets are placed on the upper edge of the fence, inside the pen. The farmer has to lift the bucket with the fresh milk above shoulder height in order to reach over the fence to fill the teat bucket.



Solution

Teat bucket and bucket holder



When investing in equipment, make sure to include a teat bucket and bucket holder ring at the right height (between hip and elbow height).

Automatic feeding machine

In the case of a large number of calves, it is advised to use an automatic, computerised feeding machine.

5.3 Feeding lambs

Feeding lambs is a demanding task, with the lambs needing to drink every 4 hours, day and night. The feeding is done by hand, often in a forward bended position, unless the farmer makes the opportunity to sit down.



Solution

Automatic feeding machine



In the case of a large number of lambs, it is advised to use an automatic, computerised feeding machine.

6. Working techniques

Stable work is physically demanding and associated with difficult working postures and movements, strenuous and static muscle loads. It is important to prepare for the physically demanding work and to help prevent musculoskeletal disorders by being physically fit and welltrained.

Furthermore, learn how to practice working techniques so they become natural for you.

- *Keep your body in good trim by regular physical exercise*
- *Use supports, tools, machinery when possible*
- *not use more muscle strength than the task requires*
- *Lifting a load – put your feet around the load, keep the load close to your body, bend your knees AND keep your back straight*
- *Carrying a load – if possible divide the weight equally between your hands or carry the load symmetrically*
- *Turning with a load - move your feet instead of twisting your back*
- *Avoid lifting above shoulder height*

Work near your body use both hands or alternate, and avoid extending your joints to more distal positions.

General information

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Goal of the project is to further implement the European social partners’ agreement of GEOPA-COPA and EFFAT by developing prevention policies and good practices to reduce musculoskeletal disorders in agriculture and to disseminate the results. For the following tasks good practices are presented:

- Livestock handling*
- Working with machinery*
- Manual stable work*
- Greenhouses*
- Dairy small ruminants*
- Milking cows*
- Tractor driving*
- Ground level manual crops*
- Pruning*
- Sorting and packaging*
- Harvesting*

For more information on the project: www.agri-ergonomics.eu.

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