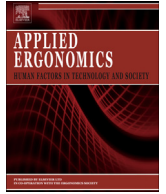




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## Delivering meat carcasses/cuts to craft-butcher shops: An investigation of work characteristics and manual handling hazards

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### ABSTRACT

This study investigated delivery scenarios of service drivers working in the retail meat industry. The methodology included analysis of accident reports, and field investigations of deliveries at craft-butcher shop premises, including semi-structured interviews with managers and workers. The findings provide greater clarity about the hazards in this job, and suggest for peripatetic delivery activities, four main factors on which decisions about risk and good practice may be made: composition of the orders; characteristics of the delivery vehicle/truck; handling method most often used; and, the road/access conditions.

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### 1. Introduction

Despite the dominance of supermarkets in Europe over the past few decades, smaller retail shops are still fairly prevalent. These include craft-butcher shops (craft shops) where consumer-specified portions of meat are prepared and sold on needs basis, or used in affiliated 'cottage' food service establishments. An in-house survey of craft shops by one Local Authority in the South West region of England identified that there were 54 such premises across four Local Authorities, which when scaled across 407 Local Authorities in the UK, suggested the existence of 5500 premises. Unlike supermarkets, which are often large scale purpose-built businesses with mechanical aids and/or automated systems to move goods around, most craft shops (often family run businesses) lack the resources to install automated handling systems and rely on service drivers for delivery of their meat orders.

Service drivers in the meat industry are responsible for driving a pre-stocked truck/van, from one craft shop to another, and transferring individual items into each premise, sometimes to awkwardly positioned storage areas and over distances of more than 30 m. Like many other delivery drivers, their work is primarily decentralised, and includes an alternation of driving and manual

handling activities (Van der Beek, 2012). However, according to the needs of the industry, the work involves large non-uniform standardised loads (meat cuts and carcasses), which may weigh more than 25 kg, and self-selected male workers i.e., those with considerably more than average strength (up to 90% strength capability of the UK population). These factors often make it difficult to implement norms for management of the associated risks. Though the manual handling hazards and risks of injury for delivery drivers have received increased research attention over the last few decades, the efforts have mainly been concerned with movement/delivery of boxes/sacks and palletised loads (Hedberg, 1985; Okunribido et al., 2006; Friswell and Williamson, 2010; Shibuya et al., 2010), work within/around the delivery vehicle (Van der Beek and Frings-Dresen, 1995; Olson et al., 2009; Reiman et al., 2013), and work at a specific worksite or area (Magnusson et al., 1987; Venn-Brown, 1998; Wright and Haslam, 1999; St-Vincent et al., 2005). The scientific literature about peripatetic meat delivery activities and manual handling away from employer-controlled worksites is sparse (Sinsoliez, 1984; INRS, 2002). Providing greater certainty about the work of meat delivery service drivers, in terms of the main factors affecting risk of musculoskeletal injury, is therefore particularly important.

In Great Britain the Manual Handling Operations Regulations, 1992 (MHOR) (HSE, 2004) places a duty upon employers to avoid, as far as reasonably practicable, the need for workers to undertake manual handling tasks which involve a risk of being injured. Specifically, employers are required to: identify the tasks performed that present hazards; assess the risk of injury associated with these

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tasks; and, to eliminate or reduce the risk as far as is reasonably practicable. When considering such risks, employers can refer to the guidance on the regulations (HSE, 2004), and derived risk assessment help tools such as the Manual Handling Assessment Charts (MAC) (HSE, 2003). Employers whose employees undertake manual handling operations away from the home premises (for example delivery drivers), are also required, where possible, to liaise closely with those in control of premises where deliveries are made, to plan how the work can be done safely; those in charge of premises where visiting employees work are required to ensure that the premises and plant there are in a safe condition. The Regulations do not set any specific requirement such as weight limits; instead, they encourage an ergonomics assessment approach (based on a range of relevant factors), to determine the risk of injury and point the way to remedial action. An example risk assessment for a butcher's shop including manual handling during deliveries is also provided by the Health and Safety Executive (HSE, 2008).

The present study was undertaken to investigate meat delivery scenarios to better understand the nature of the work. More specifically, it aimed to identify main aspects of the work that affect the risk of musculoskeletal injury and on which decisions about good practice may be made, i.e., macro risk factors. Hence the study was not aimed at quantifying the exposures to micro factors, i.e., those aspects associated with the individual and/or the immediate workstation. The study therefore involved:

- Gathering information about the work techniques, including good practices (use of manual handling assist devices, dedicated loading bays, extended rail systems, minimal lifting) to determine whether the handling practices are efficient and suitable; and,
- Gathering information about worker injury during delivery of meat carcasses to craft shops to determine the underlying causes of any injuries, and also whether service drivers are particularly prone to incidents of injury.

In the context of this study, the delivery activity begins when the driver arrives at the premises and ends when the last item in the order is deposited in a chilled storage or processing area.

## 2. Methodology

### 2.1. Field investigation

This was an observation study of craft shops and meat service drivers during deliveries, to investigate the work methods and environments in delivery activities. Interest was in:

- The effort required at different stages in terms of the types and quantities of carcasses delivered, frequency of load carriage and weights of loads handled, postures and movements of the drivers;
- The physical environments at craft shops, including types of flooring and space restrictions/obstructions; and,
- Workers' experiences of injuries and discomfort.

Examples of good practices were noted and video recordings were taken. In addition, semi-structured interviews were conducted with shop managers about compliance with the MHOR and injuries to workers, and with other workers and the drivers about their work and injuries suffered. The areas of questioning are outlined in the Table 1.

Drivers who delivered meat carcasses and quarter cuts to craft shops within one English county (short-haul driving) were studied.

**Table 1**  
Items contained in questionnaire used for semi-structured interviews.

<i>Items for drivers and workers</i>	
Personal characteristics, i.e. age, sex, weight, height	
School years completed	
Employment/occupation history, i.e. years in current job, concurrent jobs, and previous jobs	
Exercise and sporting activities outside of work	
Injuries and body pain suffered in immediate past 7 days/12 months	
Time of day of deliveries and involvement during deliveries	
Activities and problems encountered during deliveries.	
Handling techniques and frequency of application during deliveries	
Influence on and control over work including opportunities for rest	
Manual handling training received	
<i>Additional items for managers</i>	
History of inspections by regulatory inspectors	
Awareness of manual handling related legislation and guidance	
Commitment to health and safety	
Selection criteria/system for meat/carcass handlers	
Manual handling training and risk assessment program	

Four craft shops affiliated to two abattoirs, one wholesale processing centre (wholesale centre), and 12 independent craft shops were identified with the help of Local Authority Inspectors and Health and Safety Executive (HSE) Inspectors. Managers/supervisors at the two abattoirs and at two craft shops helped identify the drivers that were observed. This was, therefore, a convenience sample of drivers and craft shops.

The two abattoirs, the wholesale centre and 16 craft shops were visited between June 2007 and February 2008. From each of the abattoirs, one driver was followed from the moment they left the abattoir and videotaped while delivering goods at two affiliated craft shops; two other drivers were observed while they each delivered goods to one independent craft shop. At the wholesale centre, workers were observed and videotaped during the off-loading of carcasses from the vehicle after the driver had backed onto a loading bay. The observed deliveries occurred between 10 am and 4 pm. In all, six craft shops were visited to observe service drivers (all male) during deliveries and to investigate the physical environment scenarios, and 10 craft shops were visited to investigate only the physical environment scenarios. The 16 craft shops visited (four affiliated shops and 12 independent shops) are herein identified as sites A to P, and the wholesale centre is identified as site Q.

### 2.2. Accidents analysis

The HSE Corporate Operational Information System (COIN) database was searched for reports, made under the Reporting of Injuries Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR 1995), of manual handling accidents and incidents in the meat industry. The search was restricted to the four-year period from 2005 to 2008. Reports of incident to workers during deliveries and/or during loading/offloading of meat carcasses at a specific centre were retrieved.

## 3. Results

Table 2 presents the summary information about the observed delivery scenarios.

### 3.1. The delivery environments

The majority of the premises ( $n = 12$  craft shops and the wholesale centre, had firm, clean and level flooring, and no fixed

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