



Re-capturing bovine life: Robot–cow relationships, freedom and control in dairy farming



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A B S T R A C T

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Robotic milking machines are novel technologies that take over the labour of dairy farming and reduce the need for human–animal interactions. Replacing ‘conventional’ twice-a-day milking managed by people with a system that supposedly allows cows the freedom to be milked automatically whenever they choose, it is claimed that robotic milking has health and welfare benefits for cows, increases productivity, and has lifestyle advantages for dairy farmers. Such claims are certainly contested, but the installation of robotic milkers clearly establishes new forms of relationships between cows, technologies and dairy farmers.

This paper draws on in-depth interviews with farmers and observational research on farms to examine relationships between representations of robotic milkers as a technology which gives cows freedom and autonomy, and practices and mechanisms which suggest that bovine life is re-captured and disciplined in important ways through the introduction of this technology. We focus on two issues. First, we explore changes in what it is to ‘be bovine’ in relation to milking robots, drawing on a combination of a discursive framing of cows’ behaviour and ‘nature’ by dairy farmers and on-farm observation of cow–technology interaction. Second, we examine how such changes in bovinity might be articulated through conceptions of biopower which focus on knowledge of and intervention in the life of both the individual cow body and the herd. Such knowledge and intervention in the newly created sites of the robotic milking dairy are integral to these remodelled, disciplinary farm systems. Here, cows’ bodies, movements and subjectivities are trained and manipulated in accordance with a persistent discourse of agricultural productivism. In discussing these issues, the paper seeks to show how particular representations of cows, the production of embodied bovine behaviours, technological interventions and micro-geographies contribute to a re-capturing and re-enclosure of bovine life which counters the liberatory discourses which are used to promote robotic milking.

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1. Introduction

In this paper we explore some of the implications for dairy cows of being milked in systems using robotic or automatic milking machines. The paper’s key objective is to examine relationships between representations of robotic milkers as a technology which gives cows freedom and autonomy, and practices and mechanisms which suggest that bovine life is re-captured and disciplined in important ways through the introduction of this technology. The paper draws on in-depth empirical research on dairy farms and with the manufacturers of robotic milking systems to explore the

interplay between notions and practices of freedom and control in a particular animal–technology relationship.

Geographers have increasingly become attentive to the geographical dimensions of technologies in general (e.g. Kirsch, 1995; Hinchliffe, 1996; Thrift, 2005; Dixon and Whitehead, 2008). Within rural (and perhaps especially agricultural) geography there has been a shift from an emphasis on simplistic notions of ‘technology transfer’ and ‘innovation adoption’ (see Ruttan, 1996) to research which focuses on the complexities of technologies, the difference that the particularities of place and context makes to whether and how technologies are engaged with in particular circumstances, and the ways in which technologies are bound up with (for example) gendered identities (Brandth, 1995; Bryant and Pini, 2006). More recent work has responded to Bingham’s (1996, pp. 641) call to move beyond technological determinism, rejecting notions of the

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essentialised technological object and refocusing on objects as 'social ties' (p. 654). As such, the focus has been on processes of co-constitution in which technologies and their 'users' make and remake each other (see, for example, Holloway and Morris, 2008; Holloway et al., 2009 on the use of genetic technologies in livestock breeding, Holloway, 2007 on robotic milking, and Tsouvalis et al., 2000 on the use of precision technologies in arable farming).

In developing these ideas in rural and agricultural contexts, geographers have been informed by approaches derived from Science and Technology Studies which emphasise the material-semiotics of technologies. That is, a technology is not simply an artefact, but is tangled up with the constitution of knowledge-practices and cultural meaning (e.g. see, for example, Kline and Pinch's (1996) social constructivist work on farmers' innovative experiments with mechanisation; and for a wider perspective on sociotechnical change, Bijker, 1995). There is a recognition, too, of how technologies are socially produced through the ways they are promoted and marketed: Brown (2003), for example, writes about the consistent 'hying' of new technologies (an idea explored in relation to genetic techniques in agriculture by Holloway and Morris, 2008), and Kinsley (2010, 2011) describes how futures are envisaged and enacted by developers of technologies in their efforts to produce futures in which their technologies will become imperative. In such work, human users are simultaneously configured around technological futures, their bodies and subjectivities, practices and desires, necessarily co-imagined with particular technologies. In examining robotic milking machines we extend existing work on this technology (Holloway, 2007; Porcher, 2006; Porcher and Schmitt, 2012), to focus specifically in this paper on how a particular group of nonhuman animals, dairy cows, should also be considered as co-constitutive users of technologies, alongside the humans involved. From this perspective, the introduction of a new milking technology leads to the playing out of new bovine–technology relationships, to representations and constitutions of bovine subjectivities, and to processes of technological-bovine co-constitution which suggest the remaking of both machine and animal as they encounter and engage with each other.

We start by outlining how this relatively novel and unusual technology works and is different from conventional milking parlours. We then briefly summarise a theoretical framework which draws on Foucault's arguments about disciplinary power–knowledge relations and the emergence of biopower as a set of knowledges and mechanisms which foster 'life itself' in accordance with agendas concerning improving individuals' capacities and productivity. We suggest that using Foucault's ideas in relation to nonhuman animals in their relationships with or co-constitution with technologies, provides a useful perspective on how the bodies, subjectivities and productivity of farmed animals are produced.

To explore these theoretical issues empirically, we draw on in-depth field research which has had a number of different elements. First, we have interviewed representatives of the three manufacturers of robotic milking systems which are available in the UK, focussing on their views of the advantages of robotic milking and on how they interact with and advise farmers who are considering adopting, or who have adopted, robots. Second, interviews have been conducted with two groups of dairy farmers: ten who are using robots and ten who use conventional milking technologies. Farms using robots were selected on the basis of suggestions made by the manufacturer representatives. Farms using conventional milking technologies were identified by those farmers using robots: we asked them to recommend neighbouring dairy farmers who were known to them, in the hope that they would have knowledge of each other's technologies and farming practices and thus be able to provide informed comment on the differences between robotic and conventional systems. Interviews focused on the

three way interactions between humans, cows and milking technologies, on the processes of converting from conventional to robotic milking, and on debating the advantages and disadvantages of different milking technologies. Supplementing these interviews, we conducted observational and interview research on three case study farms, including one established robotic milking farm, one farm which is run in part as a teaching farm at an agricultural college and which has a robotically milked herd run alongside a conventionally milked herd, and a farm which converted from conventional to robotic milking over the course of the research. This research involved extended periods of time spent observing the interactions between cows, robots and people. Interviews were recorded and transcribed, and analysed with the assistance of QSR NVivo 9 software.

Using empirical evidence from this research process we look in detail at three themes. First, we look at manufacturers and farmers' discursive framings of animal behaviour and freedom in robotic milking systems, looking at how what it is to 'be bovine' is understood specifically in relation to robotic milking. Second, in contrast, we use interviews with manufacturers to look at the disciplinary potential afforded by robotic milking systems, pointing at how such systems are associated with the emergence of new power–knowledge relations in which cows might become represented in rather different ways. The third theme follows from this: using interviews with farmers and our observations of what happens on robotic dairy farms, we critically revisit the arguments made for bovine freedom and autonomy, arguing that robotic milking, and its associated farm architecture and information-generating capacity, has effects of discipline and subjectification on cows, inserting them into a regime of biopower which re-captures, re-encloses or re-determines what it is to be bovine.

2. Robotic milking technologies

Robotic milking machines replace 'conventional' twice-a-day milking managed by people with a system that supposedly allows cows the freedom to be milked automatically whenever they choose (Meijering et al., 2004) (Fig. 1). They consist of six different 'modules': the milking stall, the teat detection system, the robotic arm for attaching the teat cups, the teat cleaning system, the control system (sensors and software) and the milking machine itself (Hogeveen et al., 2001). While all robots share these essential features, there are some differences in the technology between the

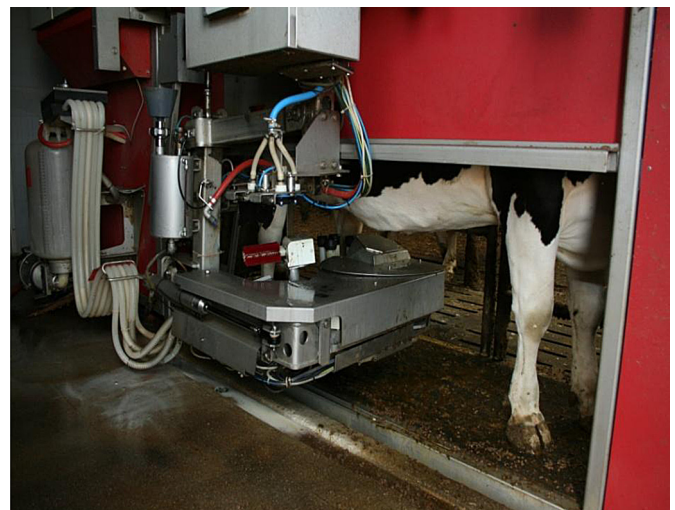


Fig. 1. Robotic milking machine in operation.

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