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Flexible use of a multi-purpose tool by a cow

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Imagine the tools a cow would make. This idea, humorously illustrated in Gary Larson's Far Side cartoon, captures a widespread assumption: cows are neither problem-solvers nor tool users. In science, as in culture, livestock species are often cognitively underestimated, reinforced by their utilitarian role and persistent mind-denial biases associated with meat consumption[1]. Despite over 10,000 years of domestication, research on cattle cognition remains scarce and confined to applied contexts such as productivity and welfare[2]. Tool use, while rarely observed, offers a stringent test of cognitive flexibility. Defined as the manipulation of an external object to achieve a goal via a mechanical interface[3], tooling ranges from species-typical routines to innovative, problem-specific acts[4,5]. We report here our experimental demonstration of flexible egocentric tooling in a pet cow (*Bos taurus*), Veronika, who uses a deck brush to self-scratch. Across randomized trials, she preferred the bristled end but switched to the stick end when targeting softer lower-body areas. This adaptive deployment of tool features reveals multi-purpose tool use not previously reported in non-primate mammals. Our findings broaden the taxonomic scope of flexible tool use and invite a reassessment of livestock cognition.

To test its flexibility, we placed an asymmetrical tool in front of Veronika: a deck scrub broom, whose orientation was semi-randomized across trials (see Supplemental information). We hypothesized that she would target difficult-to-reach body regions and use the more effective brushed end over the stick end. We recorded 76 instances of self-directed tool use over seven sessions of 10 trials. Veronika manipulated the tool with her mouth, using the tongue to lift and position it before securing it laterally in the diastema between the incisors and molars, creating a stable grip that allowed precise control of the distal end (Figure 1 and Video S1). As predicted, she applied the tool exclusively to regions on the rear half of her body (the rump, loin, thurl, udder and navel flap), areas difficult to reach otherwise. Moreover, she used the brush end to scratch her body more than the stick end, demonstrating goal-directed, context-sensitive tooling ($\chi^2 = 5.13$, df = 1, p = 0.023). Event duration did not differ between tool ends (t = 0.097, df = 67.1, p = 0.92).

Veronika's behavior went beyond these predictions, however, showing versatility, anticipation, and fine motor targeting. Unexpectedly and revealingly, Veronika's tool-end use depended strongly on body region: she predominantly used the brush end for upper-body scratching and the stick end for lower areas, such as the udder and belly skin flaps ($\chi^2 = 12.7$, df = 1, p < 0.001; Figures 1 and S1). A linear model revealed a significant interaction between body area and tool type ($\beta = -2.11$, SE = 0.74, t(55) = –2.87, p = 0.006), confirming that the effect of tool-end type on event duration varied by body area. Tool ends also corresponded to distinct techniques: she employed the broom end on her upper body in a scrubbing motion with a forward-pulling action, lifting and repositioning, between movements. When targeting delicate areas such as the udder or anal region, she used the stick end for gentle forward pushes, aiming precisely at the target (Video S2). Throughout she maintained a consistent, efficient grip, occasionally readjusting it before use, briefly releasing and re-gripping to achieve the correct orientation for the brush end.

Veronika's consistent targeting of otherwise unreachable regions indicates goal-directed self-scratching, likely driven by insect irritation. Her behavior was systematic: the broom end served for upper, thick-skinned areas and the stick end for softer ones, showing sensitivity to the mechanical affordances of each task. The stiff bristles likely provided friction, while the smooth stick end avoided abrasion. This pattern, coupled with anticipatory grip adjustments and technique diversity, reflects flexible, context-dependent tooling.

Veronika's tool-end selection cannot be explained by the broom's shape or weight distribution; she dynamically adapted her technique to each target region.

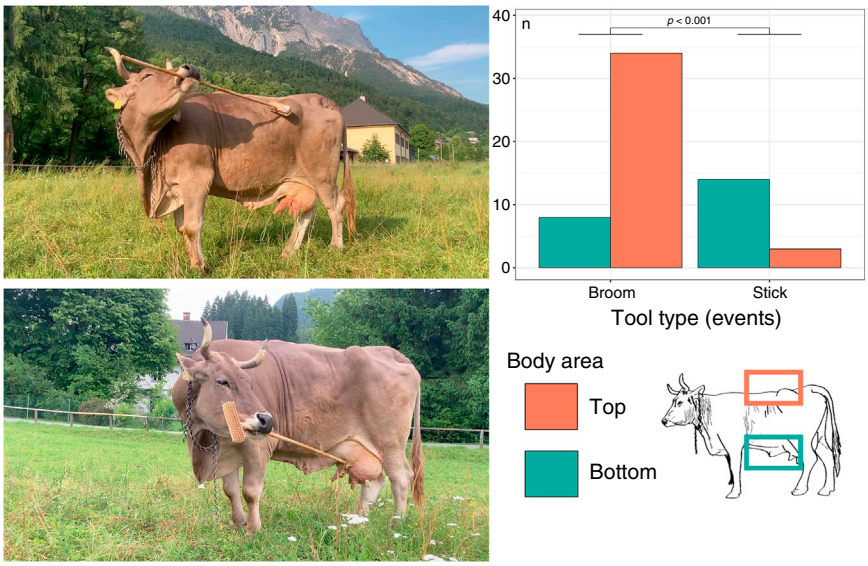

Figure 1. Veronika's tooling technique and targeted areas.
(Top left) Broom end targeted to a top area of the body (thurl). (Bottom left) Stick end targeted to a bottom area of the body (udder). (Right) Number of tooling events in which Veronika used either the broom or the stick end of the tool to target the top or bottom of her body. Bars are colored by body area: top in orange-terracotta and bottom in bluish-green. A Fisher's exact test revealed a significant association between tool type and body area ($p < 0.001$), as indicated above the bars.

The observed grip switches suggest action anticipation; features associated with innovative tool use in primates and corvids. Importantly, the differential use of both broom ends constitutes the use of a multipurpose tool, exploiting distinct properties of a single object for different functions[6]. Comparable behavior has only been consistently documented in chimpanzees[7].

Egocentric tool use is often considered spatially simpler[3] than allocentric tool use and may not require a predisposition to combine objects. Yet, Veronika's behavior involved precise targeting, coordination, and dynamic control of the tool–body interface, indicating more sophisticated physical cognition than previously attributed to cattle.

Although flexible tool use has been reported in terrestrial ungulates (including a recent, well-documented case in Asian elephants[8]) prior to our study it had not been experimentally verified in cattle. Anecdotal social-media observations of tool scratching in *Bos indicus*, together with scientific yet still anecdotal reports of tool use in horses[9], suggest that such behaviors may emerge across domestic ungulates when ecological and motivational conditions are favorable. Cattle constitute one of the world's largest domestic animal populations, yet opportunities to express tool-oriented behaviors are likely constrained by the impoverished environments typical of many husbandry systems, which rarely provide objects affording such actions. Veronika's case, while arising under unusually rich conditions for a cow, suggests that when such affordances are available, cattle can express underlying capacities that are otherwise unlikely to emerge. Given that *Bos taurus* and *Bos indicus* diverged more than 500,000 years ago[10], the capacity for tool use in cattle is unlikely to be a byproduct of domestication alone but may instead reflect a deeper, latent propensity for physical problem-solving within the bovine lineage.

Despite millennia of domestication for productivity, livestock have been almost entirely excluded from discussions of animal intelligence. Veronika's case challenges this neglect, revealing that technical problem-solving is not confined to large-brained species with manipulative hands or beaks. She did not fashion tools like the cow in Gary Larson's cartoon, but she selected, adjusted, and used one with notable dexterity and flexibility. Perhaps the real absurdity lies not in imagining a tool-using cow, but in assuming such a thing could never exist.

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DECLARATION OF INTERESTS

The authors declare no competing interests.

SUPPLEMENTAL INFORMATION

Supplemental information including one figure, experimental procedures and two videos can be found with this article online at https://doi.org/10.1016/j.cub.2025.11.059. A video abstract is available at https://doi.org/10.1016/j.cub.2025.11.059#mmc4.

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