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# Dairy cattle welfare: knowledge, attitudes and practices of stockpeople from Midlands Province-Zimbabwe's large-scale dairy farms

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**Abstract**

Welfare of dairy animals and consequently their health and productivity is influenced by numerous factors such as the quality and quantity of supplement, health care given to animals, and stockpeople Knowledge, Attitudes and Practices (KAP) on animal welfare. A lot of studies have been conducted to evaluate the influence of most of the above factors on welfare of dairy animals, but very little studies focused on the influence of stockpeople KAPs of animal welfare. However, given the growing demand for milk and dairy products and the increasing global demand for animal products that are produced in an animal welfare friendly environment there is potential benefit of studying the KAPs of stockpeople towards the welfare of dairy animals. Herein, a cross sectional study involving 93 stockpeople from the 31 large-scale dairy farms in Midlands Province, Zimbabwe was conducted to determine their KAPs on animal welfare. Results of this study revealed that 67% of the stockpeople could not define animal welfare and this was significantly associated with the stockperson's level of education ($\chi 2 = 12.54$, $df = 3$, $p = 0.006$). Only 14% of the stockpeople interviewed always talked to dairy animals when handling them and this was correlated with gender ($p < 0.001$). About 20% of the stockpeople responded positively to touching the dairy animals when handling them and this was associated significantly with the stockperson's gender ($p = 0.005$). On a more positive note when stockpeople were asked to respond to whipping of animals when driving them, about 90% of the stockpeople said they never whip animals when handling or driving them. It is recommended that further studies be done to find out better and more effective ways of teaching animal welfare concepts and practices. These approaches of teaching animal welfare to stockpeople should take into account the stockpeople's cultural, religious and education backgrounds. Stockpeope due to their low renumeration may also prioritise animal welfare attributes that directly impact on production such as hunger and thirst as well freedom from diseases pain and injury.

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## Introduction

Dairy animal welfare is an important consideration for optimum production in the dairy industry [1]. Additionally in a number of developed economies animal welfare has received rising concerns from consumers of animal products [2], who are now demanding to know the particular environment and conditions in which animal products are produced, processed and marketed [3]. In developing countries even though these animal welfare concerns are not as high as in developed countries [4], concerns on animal welfare are rising due to an increase in literacy rate and globalization [5]. Several research studies in the livestock industry have shown that interactions between farmers and their animals can limit the health, welfare and productivity of farm animals [6]. Farm animals can become highly fearful of their stockpeople because of certain behaviours and attitudes exhibited by stockpeople towards animals [7]. Studies where dairy cattle are handled roughly results in a decrease in milk yield [8]. Stockpeople's knowledge, attitudes, and practices (KAP) regarding animal welfare determine their stockmanship [9]. attitudes of humans towards an object can be used to predict human behaviour towards that particular object as underpinned by the Theory of Planned Behaviour (Ajzen, 1991) and the Theory of Reasoned Action [10]. Attitudes have three components i.e [9]. cognition which refers to the person's beliefs about the object; connation which is the person's behavioural tendency towards the object and affect which is the emotional response towards the object [11]. Even though attitudes cannot be measured directly, a person's responses to any of these attitude components will help determine their attitudes. Stockpeople KAP surveys are powerful tools to help us understand the status of animal welfare and address the challenges leading to reduced animal welfare [3]. The aim of this study is to identify the current level of knowledge, attitudes and practices among personnel that look after dairy cattle from large-scale dairy units from Midlands Province Zimbabwe. The study will assist to identify the current level of knowledge, attitudes and practices among personnel that look after dairy animals from Zimbabwe's large-scale dairy farms. After these aspects are identified, tailored advice and intervention strategies may then be developed and these will be used by agriculture policy makers, development partners supporting the livestock industry and government extension agencies to improve the welfare and productivity of dairy animals in Zimbabwe.

## Methodology

### Ethical approval (002/2021)

In order to protect the rights and welfare of the participants, ethical approval was sought and obtained from the department of Department of Veterinary Field Services(DVS) in Zimbabwe (002/2021).TheDepartment of Agriculture Technical and Extension Services(AGRITEX) of the Ministry of Agriculture authorized this research and provided contacts of all dairy farmers in the province under study.

### Study site

Midlands has a total of 34 large-scale dairy farms. Holstein, Jersey and Aryshire are the most common breeds kept in these dairy farms. Before studies were conducted all the 34 farm owners/managers were called and consent to conduct the study sought for before studies began. Before studies commenced the primary researcher explained to the farm owner that participation in the study was voluntary.Three out of the 34 farmers refused to participate in the study, the study was then conducted with the 31 farmers that concerted to the study. Purposive sampling was done to come up with large-scale dairy farms to include in the study. Small-scale dairy farms were defined as those farms that produce less than 200 L of milk per day, while medium- scale dairy farms were defined as those farms that produce 200–500 L of milk per day and large-scale dairy farms were defined as those farms producing 500 L of milk or more per day and selling to a registered processor.

### Key informant interviews

Key informant interviews were held with four district state veterinarians, 27 paravets, four district livestock officers and one regional dairy officer between 16 March 2022 and 20 April 2022. Information on names and number of key informants was obtained from the Ministry of Agriculture Departments that offer extension services in the Province under study, i.e. Veterinary Services, Agriculture Extension Services and Dairy Services. All government extension agents in selected districts that offer extension services were then asked to take part in the study voluntarily as key informants. It was assumed that key informants interviewed were personnel who offer consultant and extension services to dairy farmers and stock people from study sites. The selected key informants were believed to be the main sources of information regarding the welfare of farm animals in the study area. The key informant questionnaire consisted of 10 questions. The first five questions were meant to find out what the key informants understood about the term animal welfare; whether animal welfare was an issue in their work areas and to find out if animal welfare was part of the key informant farmer training curriculum. The last five questions on the key informant questionnaire focused on how key informants perceived the KAP on dairy animal welfare by stockpeople from large-scale dairy farms in Zimbabwe. All participants for the key informant interviews were respondents who gave

consent to be interviewed, before key informant interviews commenced. The key informant interviews were compliant with the regulations for interviews concerning human participants as provided in the University of Zimbabwe Faculty of Humanities Guidelines for Ethical Eesearch. TheWorld Health Organisation(WHO) guidelines for preventing the spread and transmission of the SARS-CoV-2 virus were strictly adhered to during the interviews.

#### Activity 2: knowledge, attitudes and practices (KAP) questionnaire

The KAP questionnaire developed for by Higham et al. (2018) to determine the knowledge, attitudes and practices of United Kingdom large-scale dairy farmers on antimicrobial use and resistance was modified to develop the KAP questionnaire used for this study (appendix 1) [12].The questionnaire was pilot tested on five large-scale dairy farms in Midlands Province. On arrival at the farm the primary investigator explained to the farm owner/manager the objectives of the survey and that participation in the study was entirely voluntary and that no identity of the farm would be disclosed in future publications related to the survey. After consent to conduct the interview was given, the KAP questionnaire was administered to any three most senior stockpeople who were reported to have frequent contact with the dairy animals. This was a standardised semi-structured questionnaire with mainly closed ended questions. The questionnaire contained four sections. The first section had questions on the socio-demographic characteristics of the stockpeople such as gender, level of education and experience at work. The second part of the questionnaire had questions to test the general animal welfare knowledge by stockpeople. These questions included the stockpeople's definition of animal welfare, knowledge on the five freedoms of animal welfare, the animal welfare legislation in Zimbabwe as well as knowledge on pain experienced by animals. The third section of the questionnaire had questions to do with the stockpeople's attitudes towards animal welfare. Questions on this section were designed to measure attitudes of stockpeople towards handling of dairy cows in pens and in the milking parlour. Attitude questions were divided into four sections, ′contact with cows′; ′caring for cows′; ′′moving animals to and from the milking parlour′′ and interaction with cows during milking and other routine activities such as milking′. These were closed ended opinion questions assessed on a five point Likert scale (0 = strongly disagree; 1 = disagree; 2 not sure; 3 = agree; 4 = strongly agree). **In order to determine stockpeople attitudes towards animal welfare, the investigator first of all explained the five animal welfare freedoms to stockpeople using their local languages before asking them to rank the five animal welfare freedoms in their perceived order of importance using the Likert scale. The freedom regarded as most important was given a score of five and the least important freedom was given a score of one**Questions to assess the animal welfare practices by stockpeople were in the fourth section (last section). Responses to questions on animal welfare practices were also on a five point Likert scale (0 = never; 1 = rarely; 2 = sometimes; 3 = most of the times; 4 = always).

#### Activity 3: direct observations of stockpeople practices towards animal welfare

Each farm under study was visited at least once during the study period. After filling in the KAP questionnaire random observations of stockpeople behaviour related to their attitudes towards animals were conducted. These random observations included observation of the milking procedure, tactile and acoustic behaviour during moving and milking of animals in the parlour. Vocal and acoustic interactions categories included the way stockpeople interact with dairy animals, i.e. talking quietly, talking dominantly, talking impatiently, shouting, whistling, and clapping. Tactile interactions include petting, touching, gentle handling hand forceful, stick gentle, and stick forceful (hit with a stick with high use of force). These observations were done each time selected farms were visited and in total 75 stockpeople were interviewed.

#### Data analysis

Before data analysis commenced, all data that could lead to the identification of the individuals/farms that supplied the data were removed. Collected data was entered and cleaned in excel where descriptive statistical analysis was done and then later exported to SPSS version 23 for testing associations between stockpeople's demographic characteristics and their responses to KAPs questions using the Chi square test for associations. Frequencies of various parameters used to evaluate the KAP such as the ability to define animal welfare was first done in excel, before the data was exported to SPSS. Results of key informant interviews were used to explain responses to KAP questions by stockpeople.

## Results

#### Key informants perceptions on dairy cow welfare

Results of the interviews with key informants revealed that only 20% ($n = 36$) of the key informants could give the precise definition of the term ′animal welfare′. The majority of definitions (80%) of animal welfare from key informants lacked an appreciation of the fact that for an animal to be in good state of welfare its physiological and psychological needs must be fulfilled. However, nearly all (90%) of key informants interviewed agreed that indeed dairy animal welfare was compromised in Zimbabwe.

Key informants also alluded to the fact that heavy rains exposed dairy animals to wet conditions and this often resulted in a higher number of reported foot rot cases, particularly during the rainy season. Key respondents furthermore perceived that the KAP of stockpeople from Zimbabwe large-scale dairy farms is low. According to key informants the major reason for the perceived low KAP is that most stockpeople in Zimbabwe has no professional background in agriculture or animal husbandry. Key informants indicated that there is need for in-service training of stockpeople to improve their KAP on animal welfare. Animal welfare advocacy and farming community sensitization were also cited as some of the many ways animal welfare KAP can be improved among stockpeople from Zimbabwe large-scale dairy farms. It was clear from key informant interviews that though animal welfare was part of their farmer training curriculum most veterinarians and livestock officers did not provide any animal welfare training to dairy stockpeople during the year 2021. However, only 10% of the key informants indicated that they carry out animal welfare training occasionally i.e. during farm visits and when carrying out farmer consultations. All key informants interviewed generally agreed that dairy animal welfare was indeed linked to the animal's productivity and that all stakeholders in Zimbabwe should put their heads together to improve dairy animal welfare and consequently dairy productivity in Zimbabwe.

## KAP of Zimbabwean large-scale dairy stockpeople towards animal welfare

### Socio demographic characteristics

The majority of people interviewed (65%) were male while 35% were females. Direct observations and informal discussions with personnel from most farms visited also revealed that the majority of stockpeople in Zimbabwean large-scale dairy farms are males. Findings from this study also revealed that the biggest proportion of Zimbabwe dairy stockpeople (54.7%) had an age range of 30–39 years. The maximum level of education for the majority of participants (71%) in this study was secondary education, while 24% of the participants were primary school dropouts and only 5% possessed after tertiary education.

### Zimbabwe dairy stockpeople, KAP towards dairy animal welfare

As shown in Fig. 1, when stockpeople were asked to define or explain what they understood by the term animal welfare, 68% (Fig. 1)of the interviewed stockpeople could not make an attempt to define the term animal welfare. However, only 32% of the Zimbabwean large- scale dairy stockpeople attempted to explain the term animal welfare in their local languages. Nevertheless, the given explanations by those who made an attempt to define the term lacked a clear appreciation of the fact that for animals to be in good welfare state, their physical, psychological and physiological needs must be met. The ability to define animal welfare was significantly associated with the stockpeople level of education ($\chi 2 = 12.54$, $df = 3$, $p = 0.006$). Generally stockpeople who had secondary and tertiary education qualifications made an attempt to

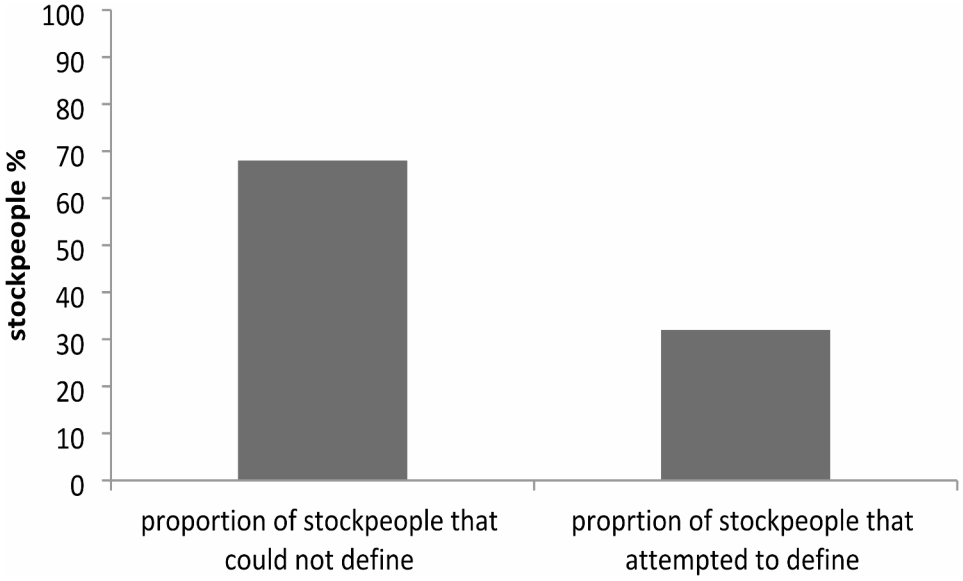


**Fig. 1** Ability to define animal welfare by stockpeople from large scale dairy farms in Zimbabwe

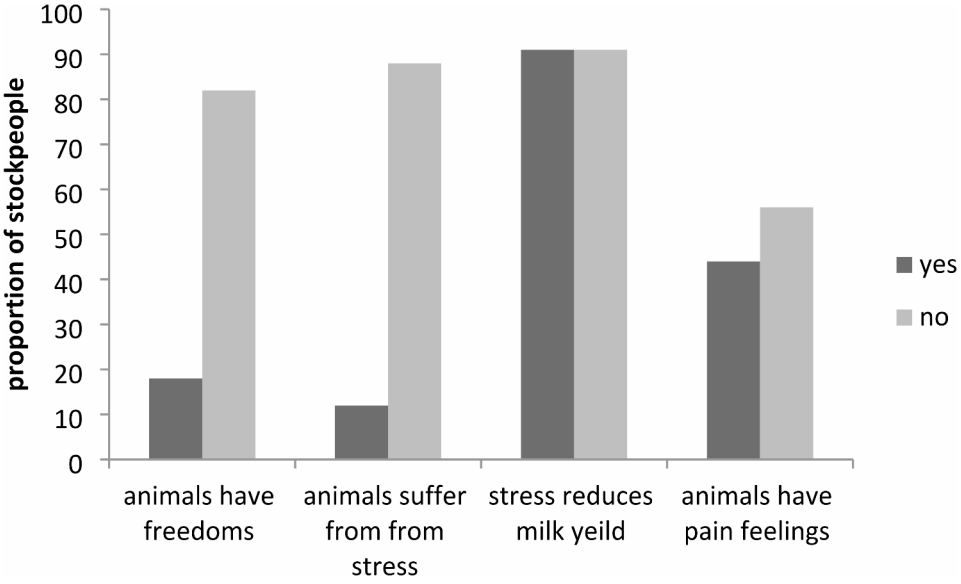


**Fig. 2** Animal welfare knowledge among stockpeople from Zimbabwe large scale dairy farms

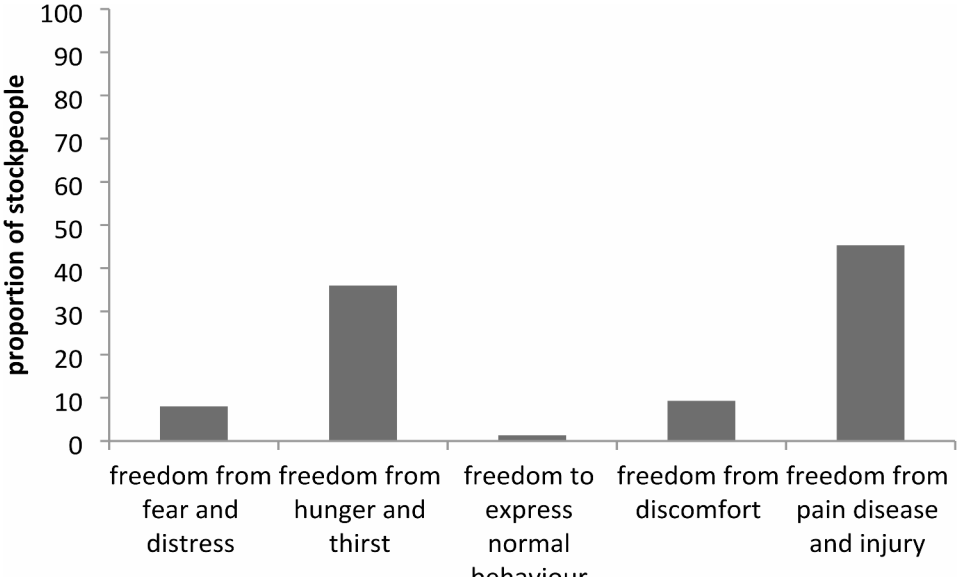


**Fig. 3** Ranking of the five freedoms of animal welfare as important freedoms by stockpeople from Zimbabwe large scale dairy farms

define the term animal welfare. None of the given animal welfare definitions were classified as best definition.

Stockpeople were further asked to respond to some questions which tested their knowledge on animal welfare From Fig. [2] below, only 18% of the stockpeople interviewed responded positively to the question that animals have freedoms, but none of those that gave positive responses could name all the five freedoms. On a more positive note, Fig. 2 below shows that a greater proportion of stockpeople interviewed responded positively to questions on suffering of animals, pain in animals and effects of stress on milk yield in dairy animals. These findings revealed that the subject of animal welfare could be understood in a different manner by stockpeople from Zimbabwe large-scale dairy farms other than what is in scientific literature.

### Zimbabwean stockpeople's attitudes towards animal welfares

. As illustrated in Fig. 3 [3] below, the highest proportion of stockpeople (45.3%) regarded the freedom from disease, pain and injury as the most important freedom, whereas the freedom from hunger and thirst was regarded as the second most important freedom by 36% of the stockpeople interviewed. The freedom from fear

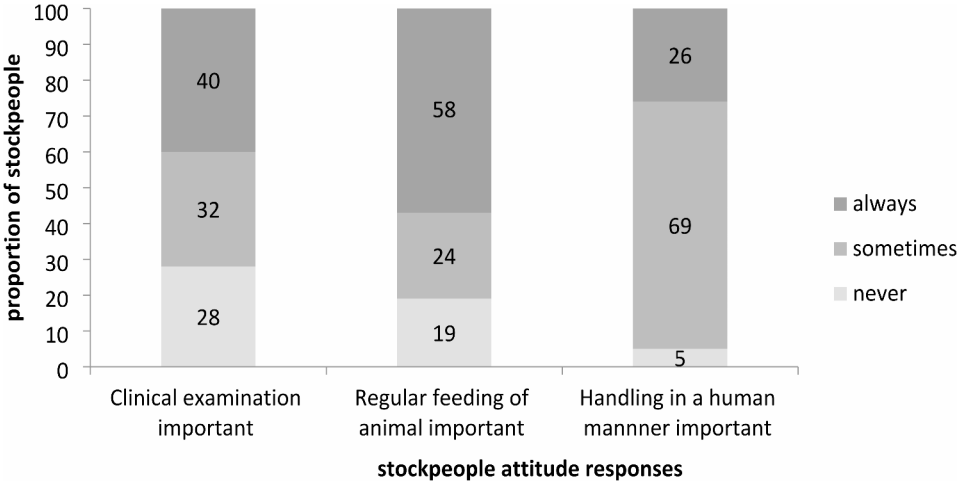


**Fig. 4** Zimbabwean large scale dairy stockpeople attitudes towards dairy animal welfare

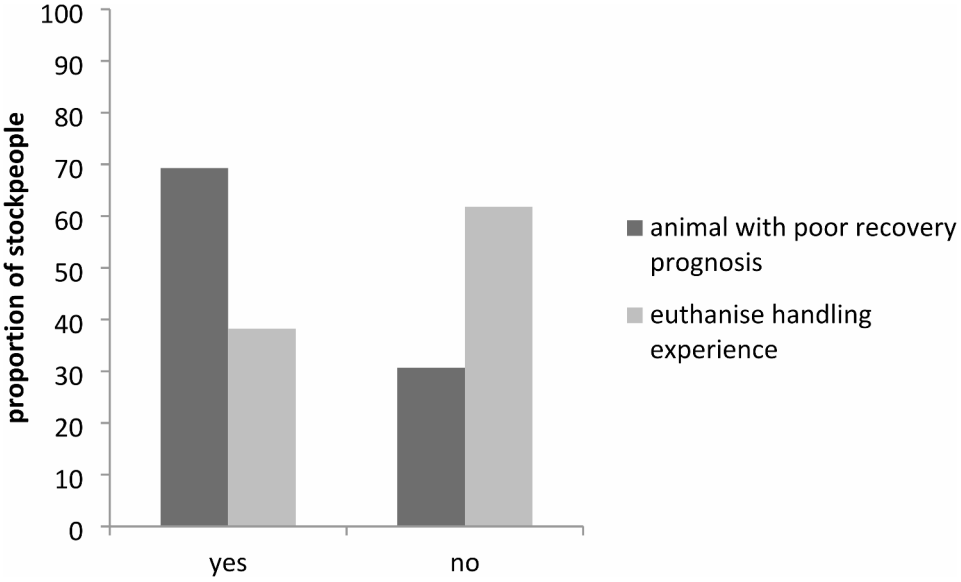


**Fig. 5** Zimbabwean large scale stockpeople responses to treatment of animals with poor prognosis for recovery

and distress was regarded as the least important freedom after freedom to express normal behaviour.

Stockpeople were further asked to respond to some questions that determined their attitude towards the welfare of dairy animals. As shown in Fig. 4 below, when stockpeople were asked to give responses on whether clinical examination of animals was an important consideration in their practice or not, responses showed that 40% of the interviewed stockpeople never considered clinical examination of animals before handling them as an important practice. Interestingly the majority of interviewees considered regular feeding of dairy animals as very important. When stockpeople were asked to respond to whether human handling of dairy cattle was an important consideration in their practice, the majority of stockpeople interviewed 69% responded that they "sometimes" considered human handling of dairy animals as important. The belief that clinical examination of animals is an important consideration was significantly associated ($\chi 2 = 24$, $df = 3$, $p < 0.001$) with dairy training received. However, there was no significant association between short courses in agriculture training received and the perception that clinical examination of animals was important in terms of animal welfare.

### Stockpeople practices towards animal welfare

In order to evaluate the practices of stockpeople towards animal welfare, the investigator used the stockpeople questionnaire and an observation tool with parameters to score the practices of stockpeople towards animal welfare. As illustrated in Fig. 5 below, 69.3% of the dairy stockpeople mentioned that they had at one point in time

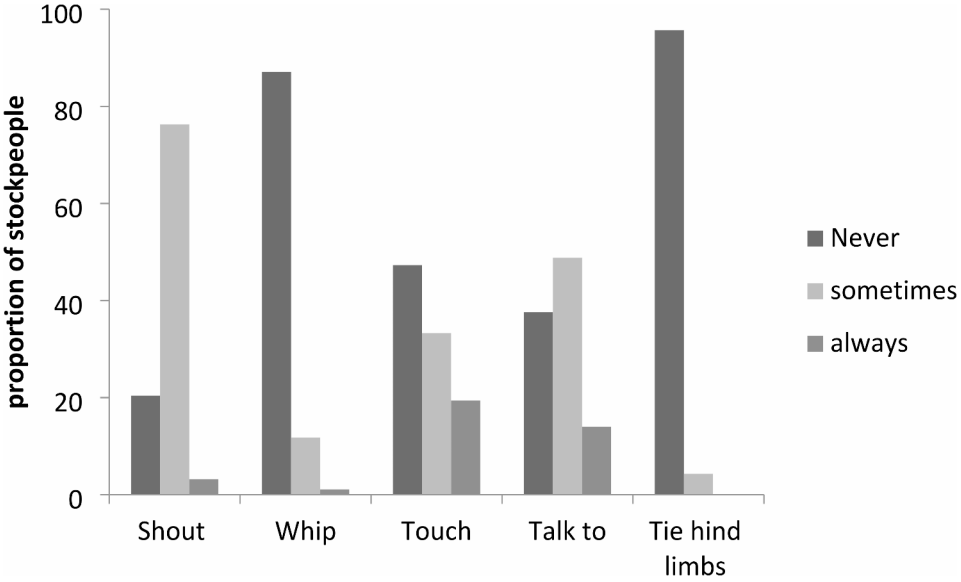


**Fig. 6** Zimbabwean large scale dairy stockpeople responses towards humane handling of dairy cows


**Fig. 7** Zimbabwean large scale dairy stockpeople responses towards hygienic practices in dairy cows

handled dairy animals with a poor prognosis for recovery. Of those that agreed that they had handled dairy animals with a poor prognosis for recovery, only 38.2% stated that the animals were euthanized with captive bolt pistols and phenytoin sodium, while 61.8% said animals were left to suffer and die without humane euthanasia.

Fig. 6 below shows the proportion of stockpeople that responded to animal welfare practices such as shouting, whipping, talking, slurry removals and teat dipping. About 14% of the dairy stockpeople interviewed, frequently talk to and only 19% touch the dairy animals when handling them. Significant association was noted between gender of stockpeople and responses to touching ($p = 0.005$) and talking to dairy animals ($p < 0.001$), with a high proportion of female stockpeople responding positively to touching/interacting and talking to dairy animals when handling them. On a more positive note it was interesting to note that the practice of tying hind limbs of dairy cows when milking them is seldom (5.3%) done by stockpeople.

Visual observations of the milking procedure (Fig. 7) together with stockpeople interviews revealed that the practice of teat dipping after milking is not something that is frequently practised by stockpeople from all dairy farms visited. Instead pre dipping is a common practice. Discussions with stockpeople revealed that the

instruction not to teat dip after milking was a way of cutting the cost of teat dip chemical used during milking.

On responses to assess the general farm hygienic practices associated with animal welfare, interviews with stockpeople revealed that slurry removal from milking parlour was done frequently by stockpeople in all visited farms (100%). Fig. 7 shows that removal of slurry from cattle pens and collection yards is seldom done by most stockpeople (82.7%).

## Discussion

The discussion section was divided into three sections i.e. stockpeople knowledge, stockpeople attitudes and finally practices towards animal welfare.

### Stockpeople knowledge on animal welfare

The high proportion (68%) Fig. 1 of stockpeople who could not define or attempt to explain what they understand by the term animal welfare points out to the fact that animal welfare issues are not well appreciated among stockpeople in Zimbabwe large-scale dairy farms. Even when probed in their local language to explain what they understand by the term animal welfare most of the stockpeople still struggled to explain the term in vernacular. On a different perspective, the findings that stockpeople could not define the term welfare could be due to the fact that the question was wrongly phrased and might not necessarily imply that stockpeople in Zimbabwe have a poor comprehension of the term animal welfare. It is important that future studies should try to re-phrase the question on animal welfare definition and make it more clear and understandable to a lay person. Studies conducted in Uganda on farmer perceptions on calf housing indicated that level of education among other factors affects the way dairy farmers house dairy calves [13]. Our outcomes corroborated the results of studies from Uganda, that the level of education could impact negatively on ways farmers house dairy calves. Dairy or agriculture related education, capacitates the farmer to practise good dairy production practices that ensures welfare of animals are well taken care of. These findings tally with responses from key informants who attributed the low level of animal welfare issues among stockpeople to their lower level of formal education. The majority of stockpeople (95%) from Zimbabwe large-scale dairy farms did not have tertiary education qualifications. Discussions with key informants revealed that the trend in Zimbabwe farms is to employ people with poor academic background. The knowledge gap on animal welfare by dairy stockpeople in Zimbabwe is further explained by the fact that only 10% of the key informants interviewed provided animal welfare training to stockpeople. Key informants are the people who are supposed to be spearheading animal welfare improvement programs in their areas of operation. The low levels of animal welfare knowledge among people who look after dairy animals may compromise their animal welfares. Compromised dairy animal welfare leads to reduced productivity of the animals [14].

### Stockpeople attitudes towards animal welfare and their implications

The fact that the freedom from disease pain and injury and freedom from hunger and thirst were considered as the two most important freedoms respectively, shows that stockpeople are more concerned by the direct benefits they obtain from cows such as high milk yield when cows are in good health and are properly fed. These findings tally with the study done in Kenya which concluded that Kenyan smallholder dairy farmers perceived the freedom from diseases, pain and injury as the most important freedom [1]. Even after a detailed explanation of all the five freedoms by the primary investigator stockpeople still had a poor conceptualization of the freedom to express normal behavior and freedom to be free from discomfort. This was confirmed by the low scores of importance that was allocated to these freedoms by stockpeople. These poor conceptualizations could be attributable to the low income base and poor education background among stockpeople [15]. Such poor conceptualizations about some welfare freedoms could in turn affect stockpeople's attitudes towards these freedoms and in turn affect welfare of dairy animals [1]. Work done on 30 family run dairy farms, who had cows housed in cubicle houses revealed that personal characteristics and attitudes are important determinants of dairy cow productivity [16], with milk yield being high on farms where stockpeople had good attitudes towards interactions with dairy animals [17]. Attitudes of stockpeople towards good animal welfare practices can be improved by regular training of animal welfare issues such as low stress handling, performing animal welfare assessments and training on the importance of the five freedoms of animal welfare to stockpeople [10]. Interviews with key informants revealed that animal welfare training is not even prioritised in the farmer training curriculum by the Department of Agriculture. The results of this study confirm the bond already established in literature reviews [18] and previous studies between the fear of animals by humans and human attitudes towards animals are important attributes required for successful implementation of any animal welfare [19]. It is therefore important that broad studies should be conducted to find out the effects of stockpeople attitudes on dairy animal indicators.

### Stockpeople practices towards dairy animal welfare and their implications

It is essential that a good human-animal relationship should exist for improved animal welfare. The human to animal relationship is a key attribute used to assess welfare of farm animals [20]. Though interviews with stockpeople revealed that 86.7% of stockpeople sometimes shout and whip (10.7%) the dairy animals when handling them (Fig. 6). Discussions with stockpeople revealed that shouting and whipping of dairy animals is done by stockpeople to express displeasure towards unwanted dairy animal behaviour. Stockpeople made it clear that the practice of whipping and shouting at dairy animals is something done in the absence and against the will of farm owners. In this study though a greater proportion (89.3%) of stockpeople reiterated that they never whip their dairy animals, the observation that there are some few stockpeople who sometimes shout and whip dairy animals they look after reflects on poor practices by stockpeople towards dairy animal welfare. Unwanted behaviours such as use of whips and shouting at dairy animals reported in this study induces fear of humans by dairy animals and eventually reduced productivity [21]. It is very important that future studies should analyse the impact of stockpeople behaviour on animal behaviour. Mastitis prevention hygienic practices such as post dipping of teats after milking is something that is practiced by very free dairy farmers in Zimabwe. This practice together with inconsistencies in slury removal in predispose dary cattle to mastitis [22]. The findings that only 6.3% of the stockpeople talk to the dairy animals when milking them could be attributable to insufficient training on animal welfare issues, cultural beliefs and upbringing. It is essential that agriculture and veterinary extension staff include animal welfare training in their farmer training curriculum if stockpeople's animal welfare KAP are to be improved in Zimbabwe [23].

## Conclusion

A cross sectional study was conducted in Midlands Province large scale dairy farms to determine stockpeople KAP on animal welfare.The study identified some good practices of dairy cow management in large-scale dairy farms that support good animal welfare. For example, very few stockpeople whip their dairy animals when milking or driving them. However, it can be concluded that stockpeople from Zimbabwe large-scale dairy farms generally have low KAP on dairy animal welfare. It is essential that the extension personnel, dairy farm owners and farm managers in Zimbabwe should invest their time and resources towards improving the KAP by stockpeople hence improved dairy productivity. It is recommended that further studies should be done to find out better and more effective ways of teaching animal welfare concepts and practices. These approaches of teaching animal welfare to stockpeople should take into account the stockpeople's cultural and education backgrounds.

#### Abbreviations

KAP Knowledge Attitudes and Practices

## Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s12917-025-04646-7.

Supplementary Material 1

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#### Author contributions

ZM: is the primary author, and was responsible for all stage of the manuscript development. PW: was responsible methodology design, editing and proof of the manuscript. TM: Data analysis and lunguage editing.

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No external funds were received to support this research. I personally funded the research.

#### Data availability

The research data has not been published elsewhere, but can be availed upon request.

## Declarations

#### Ethical approval

In order to protect the rights and welfare of the participants, ethical approval was sought and obtained from the department of department of Veterinary field services in Zimbabwe (002/2021). The, Department of Agriculture Technical and Extension Services of the Ministry of Agriculture authorised this research and provided contacts of all dairy farmers in the province under study.

#### Consent for publication

Not applicable.

#### Informed consent to participate

Before the survey was conducted informed consent to participate in the study was sort for from all participants over the phone and then visits conducted only after the participant had consented to participate. All participants were informed that participation in the study was voluntary and the interview could only proceed after consent to participate was accepted.

#### Competing interests

The authors declare no competing interests.

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## Publisher's note