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SHORT COMMUNICATION

The development of guidelines to improve dairy donkey management and welfare

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ABSTRACT

Donkey milk is a valuable product for babies suffering from multiple-allergies and cosmetic production; therefore, new dairy donkey farms are opening around Europe. Little information is available for farmers on sustainable production of donkey milk, including animal welfare, milk production, and processing. Targeted dissemination of information on appropriate animal management would assist dairy donkey farmers in preventing welfare problems. This research project aims to develop guidelines on good practice principles for sustainable donkey milk production. Different steps were followed to develop the guidelines:

1. identification of key issues for dairy donkey welfare, analysing the results of previous project and the available scientific literature;
2. systematic review research to select promising solutions for each issue included in the guidelines;
3. stakeholder consultation, in order to increase scientific soundness and to enhance their acceptability throughout the sector;
4. guidelines drafting and revisions by stakeholders;
5. guidelines launch.

The guidelines 'Dairy donkeys: good practice principles for sustainable donkey milk production' were launched in December 2017. They include suggestions derived from scientific literature and/or reported by internationally recognised experts. The guidelines provide clear and helpful advice on good animal management practices for anyone interested in donkey milk production. They comprise the following chapters: 'Responsibilities', 'Feed and water', 'Housing and Management', 'Donkey health care', 'Humane killing', 'Appropriate behaviour', and 'Milking procedures'. The guidelines, translated in different languages (Italian, Spanish, Portuguese, French, Greek and Chinese Mandarin) are freely available online.

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KEYWORDS
Donkey; welfare; guidelines; milk; management

HIGHLIGHTS

- The guidelines "Dairy donkeys: good practice principles for sustainable donkey milk production" are freely available online in six languages
- The guidelines provide clear and helpful advice on good animal management practices for anyone interested in donkey milk production
- The guidelines include suggestions derived from scientific literature and/or reported by internationally recognised experts

Introduction

The demand for donkey milk is increasing around Europe due to its unique characteristics: it is a valuable product for babies suffering from multiple-allergies (cow milk, hydrolysed cow milk proteins, goat milk, and soya) (Iacono et al. 1992; Carroccio et al. 2000; Monti et al. 2007, 2012; Marletta et al. 2016; Murgia et al. 2016) and cosmetics production. The production systems adopted range from semi-intensive to semi-extensive systems. Only a few Italian Regions have adopted specific legislation for producing and

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Table 1. Symbols and definitions adopted for critical appraisal of scientific literature throughout the guidelines.

●●●●●	Evidence obtained from meta-analysis or systematic reviews of randomised controlled trials or at least one randomised controlled trial
●●●●○	Evidence obtained from at least one controlled study without randomisation
●●●○○	Evidence obtained from at least one other type of well-designed quasi- experimental study, without randomisation
●●○○○	Evidence obtained from well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case studies
●○○○○	Evidence obtained from expert committee reports or opinions and/or clinical experiences of respected authorities

selling donkey milk (Dai, Segati, Dalla Costa, Burden, Judge, Canali, et al. 2017); neither national consortia nor best practice guidelines exist (Dai, Segati, Dalla Costa, Burden, Judge, Canali, et al. 2017; World Horse Welfare and Eurogroup for Animals 2015). Furthermore, little information is available on sustainable production of donkey milk, including animal welfare, milk production and processing (Altieri et al. 2008; Giacometti et al. 2016; Dai, Segati, Brscic, et al. 2017). Consequently, there is huge variability in the professionalism of different farmers (World Horse Welfare and Eurogroup for Animals 2015; Dai, Segati, Dalla Costa, Burden, Judge, et al. 2017). In 2017, Dai et al. highlighted that Italian dairy donkey farms do not follow uniform procedures for the management of animals and concluded that targeted dissemination of information about appropriate feeding, resources, hoof care and handling of dairy donkeys would increase awareness among farmers about donkey needs and assist them in preventing welfare problems (Dai, Segati, Brscic et al. 2017; Dai, Segati, Dalla Costa, Burden, Judge, et al. 2017).

With this in mind, the University of Milan and The Donkey Sanctuary collaborated with industry stakeholders on the development of guidelines that take into consideration good practice principles for sustainable donkey milk production, and subsequently recommend practical solutions for their implementation.

The development of the guidelines

The guidelines 'Dairy donkeys: good animal management practices for donkey milk production' were developed according to the following steps: (1) identification of key issues for dairy donkey welfare; (2) systematic review search; (3) stakeholder consultation; (4) guidelines drafting and revisions; and (5) guidelines launch.

Identification of key issues for dairy donkey welfare

The process was based on the results of a pilot research project titled 'A pilot investigation to determine welfare standards on milk/meat donkey farms in Italy and potentially influence their main drivers' (Dai, Segati, Brscic, et al. 2017; Dai, Segati, Dalla Costa, Burden, Judge, Canali, et al. 2017; Dai, Segati, Dalla Costa, Burden, Judge, et al. 2017). This preliminary investigation identified potential key issues for dairy donkey welfare. Following a face-to face meeting (see Stakeholder consultation section), scientists agreed on the selection of the key issues to be included in the guidelines.

Systematic review search

A systematic review of the available relevant scientific literature was then conducted to select promising evidence for each key issue included in the guidelines. Scientific Databases consulted were Web of Science, CAB Abstracts, PubMed, Scopus. We searched the following keywords:

donkey* OR ass OR jenny OR jack OR *Equus asinus* OR equine OR equids OR equid

AND

welfare, identification, treatment*, therapy, hoof, hooves, nutrition, diet, management, foal management, stallion management, weaning, milking, milk, dairy, human-animal relationship, breeding, reproduction, selection, transport, slaughter, slaughterhouse, abattoir.

National and European Regulations and Best Practice Guidelines on Welfare were also considered. Authors evaluated each article for their scientific robustness (Table 1). The following aspects have been taken into consideration:

- Validity: concerns the extent to which a measurement actually measures those features the investigator wishes to measure and provides information that it is relevant to the question to be asked (Martin and Bateson 1993);
- Reliability/consistency: concerns the extent to which measurement is repeatable and consistent; that is free from random errors (Martin and Bateson 1993). The smaller the error component, the more reliable the measurement;
- Relevance: connected with the matter at hand, pertinent, of impact;
- Feasibility: practical likelihood of adopting the recommendation on-farm. It is a dynamic concept, dependent on factors such as the purpose of the recommendation and budgetary constraints. Together

with farmers' and stakeholders' acceptance these comprise the main variables to be evaluated.

The scientists highlighted that certain issues were well investigated while others showed gaps in scientific knowledge.

Stakeholder platform consultation

A multidisciplinary Stakeholder Platform was established. This included public authorities, civil society (NGOs and consumers association), farmers, industry (food processors and cosmetic industry), and academics. Stakeholders were selected for their acknowledged expertise in donkey management and welfare and (as for academics) peer-reviewed publications on relevant topics. Stakeholders were contacted by email to ask for their voluntary participation. A first platform comprised 11 stakeholders from four different European countries: three farmers, three academics, two public authorities (official veterinarians and ministry), two members of NGOs, one representative of food processor and cosmetic industry. They agreed to participate in a face-to-face meeting in Milan, in which the project and the aims were presented. Experts were asked to discuss on-farm welfare related aspects, in order to agree on a list of topics to be included in the guidelines. Possible solutions, described in scientific literature or derived from stakeholders' experience, were discussed in terms of the following parameters: importance (meaning the significance of the issue and the proposed solution for on-farm donkey welfare), appropriateness (meaning the relevancy of the proposed solution with the issue), effectiveness (meaning the ability of the proposed solution in solving the issue).

The Stakeholder Platform was enlarged using a snowballing technique: members were asked to introduce two colleagues to be contacted by email to join the Stakeholder Platform. The final Stakeholder Platform comprised 29 European members: 5 farmers, 10 academics, 4 public authorities, 7 members of NGOs, 1 representative of food processor and cosmetic industry, 1 representative of consumers, and 1 farrier. Experts were asked to revise the guidelines drafts (see following paragraph).

The stakeholders' involvement was intended not only to increase scientific information contained in the guidelines, but also to identify potential barriers to the practical application of the guidelines, and possible solutions, and enhance their acceptability throughout the sector.

Guidelines drafting and revision

After the meeting, a first draft of the guidelines was prepared based on the outcomes of the stakeholders' consultation. The draft guidelines were available online on a dedicated website (http://donkeynetwork.org.uk/) for a month to allow the Stakeholder Platform to revise them. Valuable feedback was obtained about suggestions for modification or requests for additional evidence, or alternative interpretation of evidence. Experts of specific sectors (i.e. reproductive medicine, nutrition, farriery, milking procedures, parasitology …) were asked to provide opinions on the topics not covered sufficiently in the scientific literature. The Stakeholder Platform was also able to contribute to and influence the graphic appearance of the final guidelines. Following the stakeholders suggestions, a second version was drafted and submitted for further revisions. The second draft was available online for 1 month. After the second revision, a final version of the guidelines was prepared and submitted for design and translation in to Italian, Spanish, Portuguese, French, Greek, and Chinese Mandarin.

Guidelines launch

The document 'Dairy donkeys: good animal management practices for donkey milk production' was firstly presented during the Intergroup 'Welfare and Conservation of Animals' meeting at European Parliament in Strasbourg on Thursday 26 October 2017.

A face to face final meeting of the Stakeholder Platform was organised to present the guidelines and to draft a communication plan. The document was also made freely available online on the website http://donkeynetwork.org.uk/.

The guidelines

The guidelines 'Dairy donkeys: good practice principles for sustainable donkey milk production' are designed to provide clear and helpful advice on good animal management practices for anyone interested in sustainable donkey milk production. They can be freely downloaded at http://donkeynetwork.org.uk/. They contain the following chapters: Responsibilities, Feed and water, Housing and Management, Donkey health care, Humane killing, Appropriate behaviour, Milking procedures. Each section contains information about:

- Essential requirements. The essential requirements designated in this document must be met under law for livestock welfare purposes. Jurisdictions

Table 2. Interpretation of symbols used in the guidelines.

	Essential requirements
	Additional practices
	Warning
	Further information

may vary in their definition of specific terms under their animal welfare legislation. Every endeavour has been made to adopt terms that have nationwide application. Readers are urged to check the relevant definitions under the relevant legislation to their jurisdiction.

- Additional practices. The additional practices to achieve desirable animal welfare outcomes are consistent with the recent scientific literature. They have no force of law, use the word 'should' and complement the essential requirements. Where appropriate science is not available, the additional practices reflect a value judgement that has to be made for some circumstances. Numbers in brackets refer to scientific papers reported in the References section at the end of the document.
- Warning. Take note topics, which could represent a serious issue for animal welfare.
- Further information. Additional material (such as pictures or tables) which can be a useful practical tool to ensure animal welfare.

Symbols have been used throughout the document in order to identify each section (Table 2).

Reflections and future steps

This article presents the approach adopted to develop the guidelines 'Dairy donkeys: good animal management practices for donkey milk production'. The document is comprehensive and easy-to-use and includes suggestions derived from scientific literature and/or reported by internationally recognised experts.

In order to raise awareness and encourage the use of the guidelines by those involved in the production of donkey milk, the Stakeholder Platform agreed on a communication plan. An endorsement at European Level is desirable in order to enhance the welfare of donkeys kept for milk production and it is hoped that European Union policy makers will use these guidelines as a basis for improving the welfare of dairy donkeys throughout Europe. The official veterinarians have been recognised as a main actor for the guidelines dissemination, since they have frequent contacts with the farmers and the civil society. Meetings will be organised in order to introduce them the guidelines and to ask their collaboration in the dissemination. Hard copies of the document will be delivered to farmers; specific events (such as fairs or farmers events) will be selected to present and distribute the document. Finally, the website will be advertised throughout social networks.

Conclusion

These guidelines, translated in different languages and freely available online, will permit a targeted dissemination of information about appropriate management procedures for dairy donkeys, increasing awareness among farmers about donkey needs and assist them in preventing welfare problems.

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Disclosure statement

No potential conflict of interest was reported by the authors.

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