



Meeting nutritional needs to ensure dairy donkeys' welfare

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Introduction

Increased interest in the use of **donkey milk**

for infants affected by cow milk protein allergy (CMPA) or multiple food intolerances

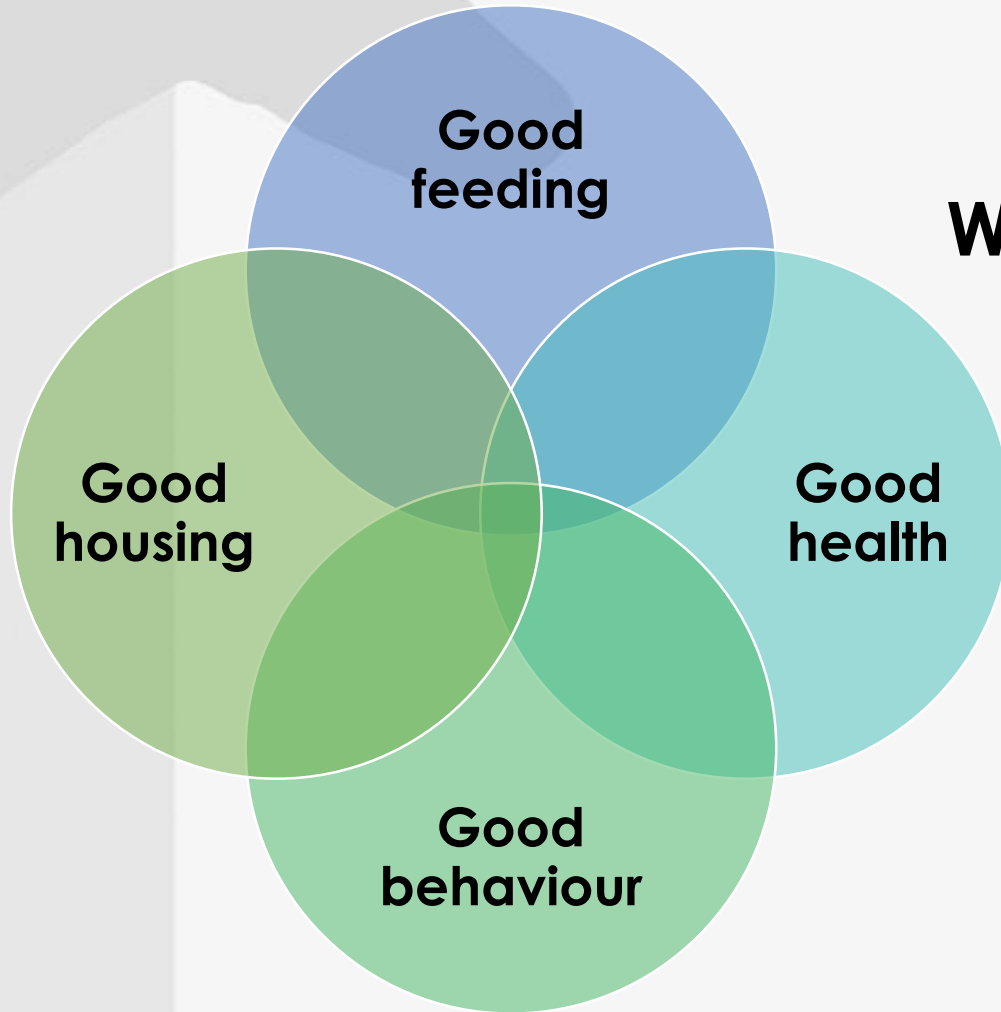
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enhanced number of **dairy donkey farms** in Europe



(Monti et al., 2012)

Introduction



AWIN
Welfare assessment protocol for donkeys

Good feeding plays a crucial role
for dairy producing animals

Introduction

AWIN Welfare assessment protocol for donkeys

Welfare Quality Principle	Criteria	Animal-based indicators
Good feeding	<ul style="list-style-type: none">- Appropriate nutrition- Absence of thirst	<ul style="list-style-type: none">- Body condition score- Skin tent test- Water availability

Other requirement should be taken into account



Introduction

Need for better comprehension of dairy donkeys' nutritional needs

Aim of the work

Review available scientific literature and provide some proposals about dairy donkeys nutritional requirements

Discussion

Energy requirement (ER) for lactating donkeys

Average milk production (BW 300 kg): 4-6 l/day
in the first 6 months



4 l: foal nutrition
(BW gain 3 kg/week)



0.8-2 l: milk yield

Discussion

Energy requirement (ER) for lactating donkeys

- median ER for 1 litre **milk** production: **3 MJ DE** or **2.54 MJ NE**
- median ER for **maintenance**: **0.09 MJ DE/kg BW** or **0.29 MJ NE/kg BW^{0,75}**

Discussion

Energy requirement (ER) for lactating donkeys Estimated median values

Requirements	Digestible Energy (DE), MJ	Net Energy (NE), MJ
Maintenance (300 kg BW)	27	20.9
Milk production (5 l/day)	15	12.7
Total ER lactation	42	33

Increase above maintenance requirements: 55,5 - 57,8%

Discussion

Energy requirement (ER) for lactating donkeys

- Estimated **dry matter intake: 1.6% BW** (4.8 kg for a 300 kg jenny): a poor quality forage (3.2 MJ NE/kg DM) will not be enough to cover ER
- Perform **forage analyses**. If necessary add:
 - Cereal based concentrates: 35% ration during first 3 months, or
 - Forage-based product with higher energy content
- Avoid sudden changes (4-6 weeks)

Discussion

Energy requirement (ER) for lactating donkeys

- Always monitor **BCS** to adjust the ration energy content
- 1/2 – 1 BCS (on a 5 point scale) can be lost during the first 2 months of lactation: jennies should arrive at foaling with BCS $3\frac{1}{2}$ -4



(Smith and Burden, 2013)

Discussion

Protein requirement for lactating donkeys

- Little information available on Crude Protein requirement
- Matières Azotées Digestibles Cheval (**MADC**):

Median requirements	MADC, g
Maintenance (300 kg BW)	151.3
Milk production (5 l/day)	165
Total MADC lactation	316.3

Increase above maintenance requirements: 109%

Discussion

Vitamins and Minerals Requirements

- Unknown
- Use of **horse requirements**: donkey requirements are likely to be lower
- **Pasture**: green forage increase liposoluble vitamin content of milk



Discussion

To provide an overall nutritional assessment,
should also be evaluated:

Animal-based indicators

BCS evaluation is not
sufficient to evaluate
«Good feeding»

Proposed Fatty Neck Score
and BW measurement

Management based- indicators

Bedding, grouping strategy,
dental and hoof care, etc.

May affect nutritional
welfare

Conclusions

Necessary to **optimize** the nutritional welfare of dairy donkeys, taking into account an **integrated** set of indicators

Scarcity of information in the current literature: **need for further studies** on requirements and indicators





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