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Donkey nutrition and feeding: Nutrient requirements and recommended allowances –  
A review

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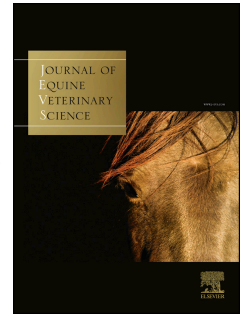
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# <sup>1</sup>Donkey nutrition and feeding : Nutrient requirements and recommended allowances – A review

William Martin-Rosset

*Scientific editor of Equine nutrition INRA 2015:  
Nutrient requirements, recommended allowances and feeds tables*

## Abstract

There are 44 millions of donkeys worldwide of which 95% are working. However, limited research programs dedicated to donkey are carried out over the world. Indeed, the donkey is having a specific nutritional status. The donkey use a selective feeding strategy when it is foraging either poor or good feedstuffs. The ingestibility of the diverse types of forages is different. Intake rate seems to be rather slow while the mean retention time of feeds residues in the digestive tract is very slow. As a result, the digestion coefficients of the chemical components of the feedstuffs are high, namely the cell walls. The digestion coefficients increase when the donkey is fed restricted comparing with *ad libitum* for the mean retention time slows down. So far, the VFA production in the large intestine is very high. The donkey takes the advantage of a very high N-recycling ability. Water intake is related to the type and the amount of forage which is offered and the environmental conditions. The donkey is able to support temporary water deprivation without too high limitation of intake. And it is able to rehydrate quickly.

The energy and protein requirements are much lower comparing with other equids. Minerals and vitamins requirements are not yet established. One could expect that the key ratio between some minerals and vitamins as well should be met but we do not know if there are any specific sparing mechanisms as for nitrogen. For rationing there are some key tools that are available for estimating live live weight and body condition and for predicting water consumption. But the intake capacity of resting and working donkey is poorly described. However, there is no substitution between forages and concentrate when feeding mixed diets. Unfortunately, there are neither tables of nutritive value of feeds nor recommended daily nutrients and intake allowances for donkey. Indeed, further investigation should be carried out in the scope of large cooperation.

**Keywords:** Donkey, nutrition, feeding, requirements, allowances

## 1. Introduction

The donkey (*Equus asinus*) is a member of the “Equus family” just like the horse and the pony, but it has its own physiology and metabolism, which means different nutrient requirements and recommended allowances. Unfortunately, there is far less experimental data on the donkey than the horse and the pony (for review, see [1, 2, 3, 4]).

There are about 43-44 million donkeys working in the world [5, 6]. Asia has the highest population, counting 20.8 million of which 5.4 million are in China [7]. Africa has 13.7 million, of which 5 million are in Ethiopia. Latin American and the Caribbean countries count 7.7 million, mainly concentrated in Mexico (3.3 million) and Brazil (1.4 million). There are only 0.52 million donkeys in Europe, mainly found in Bulgaria (0.29 million) in Turkey (0.17 million) and in Spain (0.14 million). All these statistics have been recently detailed by several authors in the proceedings of the 1<sup>st</sup> symposium on donkey science [8]. Most donkeys are managed for work, where they are used for pack transport, pulling carts, farm tillage and sometimes for raising water and milling [5, 8]. The jenny is milked in a few countries, mainly in China and Italy, for use in the cosmetics or pharmaceutical industry [9, 10]; as a very-early-age substitute for human breast milk or with cow's milk in protein-allergic newborns [11, 12]. Donkeys are also marginally prized for their meat in Europe and China [7, 9]. In

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