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Review Article

Donkeys Are Different

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ABSTRACT

As a unique species of equine, the donkey has certain specific variations from the horse. This review highlights the origins of the donkey and how this impacts on its behavior, physiology, and propensity to disease. The donkey is less of a flight animal and has been used by humans for pack and draught work, in areas where their ability to survive poorer diets, and transboundary disease while masking overt signs of pain and distress has made them indispensable to human livelihoods. When living as a companion animal, however, the donkey easily accumulates adipose tissue, and this may create a metabolically compromised individual prone to diseases of excess such as laminitis and hyperlipemia. They show anatomic variations from the horse especially in the hoof, upper airway, and their conformation. Variations in physiology lead to differences in the metabolism and distribution of many drugs. With over 44 million donkeys worldwide, it is important that veterinarians have the ability to understand and treat this equid effectively.

1. Introduction

The domestic donkey is a unique and much undervalued species whose ancestors the African Wild Ass evolved to survive in semiarid, mountainous environments with sparse food sources and intermittent access to water. Domesticated only for approximately 5,000 years, the donkey has been and still is used for draught and production purposes and working and living alongside humans all around the world [1,2]. More recently, the donkey has also found a role as a pet and companion. In some cultures, donkey milk and meat is also much prized. Although the donkey has a rich and important role in human development and history including featuring in many religious texts and historical stories, the donkey has often been denigrated as a lowly beast of burden and is frequently looked on as the "poor relation" to its oft more respected "cousin" the horse.

Those who own or work with donkeys know that although there is shared heritage between the donkey and horse, they are remarkably different in their physical traits and behavior. The difference in chromosome numbers (horse 64 and donkey 62) renders crosses between the species infertile. Donkeys are famed for their longevity giving rise to the saying "donkeys years" with many living in excess of 30 years and offering a lengthy "working" life [3]. Commonly held beliefs that donkeys do not feel pain and are stubborn or stupid are almost certainly due to people looking at donkeys and judging them using the wrong behavioral and physical scales, most notably those of the horse [4]. It is the authors' experience that donkeys display more subtle behaviors than does the horse and may exhibit different behavioral repertoires when frightened, in pain, or pressurized. Similarly, veterinary care of the donkey must take into account the many physical differences that the donkey has when compared with the horse.

The donkey is a unique species with many important differences that should be noted and appreciated when working with, managing and treating; it is no longer acceptable to simply look on the donkey as a small horse. This review aims to provide the reader with an overview of the nature of the donkey and how best to care for and treat donkeys to improve their quality of life.

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2. The Origins of the Donkey

Descended from African Wild Asses, the domestic donkey has retained many traits of its ancestors who would naturally live in semiarid and often mountainous environments [5], characterized by sparse vegetation, dispersed water sources, and widely fluctuating temperatures. Steep terrain with narrow, rocky mountain paths contrasts with the ancestral home of the donkeys' cousin the horse that would inhabit open grassy plains.

Donkeys' evolution in sub-Saharan Africa has adapted them to coexist with a number of diseases that are considered "exotic" or transboundary, this partly accounts for their use as draught animals in regions where horses cannot thrive [6]. The evolution of the donkey as a desert dwelling animal able to survive in some of the harshest conditions on earth has been used and exploited by humankind often with little thought for the true nature of this important species.

3. Donkey Behavior

The natural behavior of the donkey has been shaped by its origins. The natural environment of the donkeys' ancestors may, on occasion, offer plentiful enough food and water to support the formation of small donkey herds, which imitate the larger "herd" structure adopted by horses with dominant stallions ruling a harem of mares [7]; horses are capable of living in such a manner as food and water in their natural plains habitats is normally in abundant enough supply to support many equines. In the natural environment of the donkey, such plentiful resources are rare, the donkey has therefore adapted to live in very small groups of two or may be found as solitary animals, only coming together to breed or when resource availability improves [8]. To improve the chances of finding mates, a donkey jack may hold a "territory," often around a water source [9]. Jenny donkeys may also guard food and water resources by establishing a territorial range, such territorial behavior is different to that displayed by free-ranging wild horse populations who are not generally territorial [10]. This explains why domestic donkeys may display territorial behavior when living alongside other animals. Such behavior may lead to the donkey coming into conflict with other species that it does not perceive as "belonging," reports of attacks on small livestock or predators by donkeys (and mules) are relatively common and consideration should be given to this entirely natural behavior when mixing new animals with donkeys [11]. These guarding instincts have been harnessed by people around the world by using the donkey as a guardian to protect sheep, goats, and other livestock from attack by predators such as dingoes and coyotes [12].

As herbivores with many natural predators, the donkey has evolved with a natural "flight or fight" reaction. For many millions of years, the donkeys' ancestors have chosen to run away from predators or when they feel threatened. However, if the situation warrants it, they will use their natural weapons of teeth, feet, and bodyweight to "fight." The fight instinct of the donkey is more easily engaged than that of the horse whose default reaction is nearly always flight [13]. As donkeys frequently live on their own or with their foals, fleeing is often not the best mechanism of defense; fleeing as part of a pair, you or your offspring are always likely to be the slowest and may end up being caught, and fleeing in mountainous terrain also poses particular hazards. Therefore, donkeys are much more apt to consider their response to a threat, and when fleeing does not appear prudent, they will engage their "fight" response [14]. For practical purposes, this means that clinicians and handlers need to allow a donkey time to work a problem out, avoid being crushed between a donkey and obstacle and in many ways enjoy working with an animal less inclined to panic than the horse.

Donkeys are naturally gregarious animals, and despite the often solitary existence of their ancestors in the wild, they prefer and thrive when provided with company of their own species. Donkeys bond strongly, and studies have shown the phenomenon of lifetime or long-term "pair-bonding" in donkeys [15]. Although donkeys will live contentedly with other equines for company, research has shown that when given choice, they will tend to choose to bond and socialize with other donkeys when placed with a choice of donkeys, ponies, and mules [16]. The complex nature of donkey bonding is not fully understood, but practical experience at The Donkey Sanctuary has demonstrated the importance of not underestimating this trait. For example, donkeys may become stressed and refuse food or water when removed from a bonded companion which may put them at risk of developing the potentially fatal disease hyperlipemia.

Despite many sayings to the contrary, the donkey is neither stubborn nor stupid [17]. Unfortunately, the donkey's natural propensity to freeze when threatened or frightened and their calm, stoic dispositions have led people throughout history to brand the donkey as such. Recent research carried out at The Donkey Sanctuary showed that both donkeys and mules out performed horses (and in the case of mules they outperformed dogs) in a test of spatial cognition and perseveration abilities. Both donkeys and mules were more accurate and faster problem solvers when challenged to detour through a changing gap to reach a food reward [18]. It is always important to take account of this quick learning ability when training donkeys and mules, as they are able to learn both wanted and unwanted behaviors very quickly.

4. Nutrition for Donkey and Mules

The ancestors of the domestic donkey evolved as browsers as well as grazers and survived on lignin rich, low energy, fibrous plants, which they would have to range for many miles to obtain, spending 14–18 hours per day foraging over distances of 20–30 km per day [19]. Donkeys kept in domestic environments rarely have the opportunity to exhibit this combination of natural behaviors.

The donkey is a hindgut fermenter and has evolved to have a steady trickle of fibrous plant materials moving through the gut at all times. When compared with horses, donkeys are highly efficient at digesting poor nutritional quality fiber, the donkey's maintenance energy requirements are considerably lower with stated levels varying