



# PACK TRANSPORT WITH DONKEYS

Pack donkeys have been used for thousands of years and can still be the appropriate solution for transport in remote mountainous regions where the roads are few and difficult. Denis Fielding describes how pack donkeys should be selected and their saddles arranged for maximum efficiency.

Folk technologies such as using donkeys for pack transport have received little attention from extension or research workers. The purpose of this article is therefore to highlight the important aspects in the management of pack donkeys as a contribution towards using them better.

It is recommended 'that the value of pack animals be recognised for alleviating the work of women and children and that such draught animals be encouraged where socially and economically justified'.  
FAO (1982)

Packing is one of the most ancient forms of transport which preceded even the invention of the wheel. That it has survived to the present day serves to emphasize its value. The major advantage of pack transport is its effectiveness in the absence of roads, in hilly and mountainous terrain and in muddy and marshy areas. It is particularly effective where access is limited -this applies not only to remote mountainous areas but also to areas of high population density as in city centres. Donkeys are usually cheap compared to other draught animals and an adequate pack saddle normally requires relatively little monetary investment. However pack donkeys do have some limitations which include:

- Small size of the load
- Relative slowness
- High labour requirement (although this could be an advantage in some circumstances)
- Energetically less efficient than using a cart

So it is clear that pack donkeys are not universally appropriate or even a feasible option in many countries. But, where they are a feature of the existing transport system it is sensible to consider how their management might be improved.

## Selection and training

The important factors in selecting donkeys for pack work are:

- size and condition
- conformation
- hooves and legs
- sex

The pack donkey needs to be healthy and free from skin and hair blemishes, particularly on the shoulders and back.

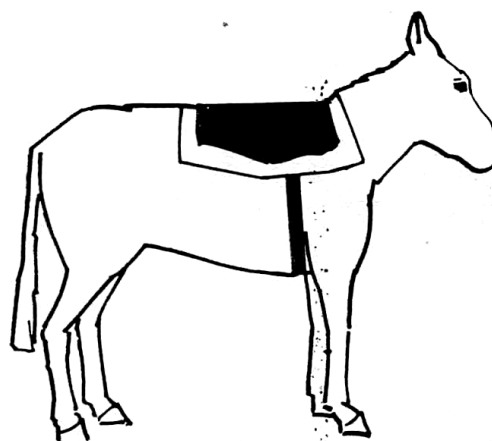


Figure 1: Make sure the saddle strap is well forward so that the lungs are not constricted

Larger donkeys are normally preferred to small donkeys because pack capacity is a function of weight.

According to the donkey's condition, the nature of the load and the terrain to be covered the load may range from 25 to 40 per cent of live weight with a mean of 33 per cent, one third of live weight, being a sensible compromise. Most donkeys are 110 to 150kg, implying a load of 40 to 50kg. There is considerable variation in donkey size and conformation thus giving scope, if desired, for the selection and breeding of bigger donkeys with increased carrying capacity.

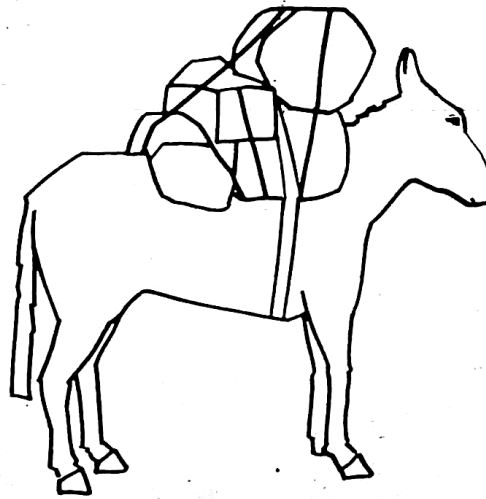


Figure 2: Do not overload a pack donkey, and make sure that pack is even

The conformation requirements of a pack donkey include the length of the back, which should be short. Efficiency in packing depends on keeping the load as far forward as possible over the shoulders. This can most easily be achieved when the donkey has a convex or flat back, as compared to a concave back which encourages the pack to slip backwards off the shoulders. Width of chest is associated with lung capacity and strength and should be preferred to narrow chestedness.

Hooves should be free from faults such as excessive uneven growth, cracks, flaking, etc. Straightness of the front legs as seen from the front is important. 'Bow-legged' or 'knock-kneed' donkeys are unlikely to be as effective in the long-term as those with good leg structure.

Also important is the gait or movement of the donkey. Some donkeys move in such a way that their packs rock excessively as a result of their walking action. Other donkeys create much less rocking in their packs as they move and should be preferred. Any movement of the pack from its optimum position requires work, and therefore energy, to constantly restore it to that position.

In the dryer areas where donkeys are mostly found their hooves are usually very hard and shoeing may not be necessary. If shoeing is required it may be sufficient to shoe only the front hooves which take most of the weight of the pack and therefore wear more quickly than the rear hooves.

Either entire or castrated males are normally best for packing. If donkeys are to be driven in droves then the mixing of males and females is not desirable, as fighting between the males will occur as they each try to achieve dominance.

The training of pack donkeys is not usually difficult provided the donkeys have been handled from youth. The danger is in starting training too soon and deforming the donkey by excessive loading before it has fully developed. Ideally, regular pack use should not begin until three or four years of age, i.e. one year after the onset of puberty at two to three years. Once trained, pack donkeys should be used regularly and sensibly to maintain fitness. It is more efficient to use fit animals regularly than to use unfit animals irregularly.

### Pack saddle design and use

The pack saddle is an important component of the packing system in that it represents the point of interaction between the load and the animal. It often rests on a saddle blanket and, at its simplest, it can be a rope net or a bag stuffed with dried grass. At the other extreme it can be individually made to suit the conformation of a particular animal. In practice, however, it commonly resembles a mattress placed over the back of the donkey and held with a rope or belt round the belly. Chest and/or rump straps may be used to minimise the movement of the saddle during work.

The purpose of the saddle is to distribute the weight of the pack as evenly as possible on each side of the spine and to keep the weight over the shoulders. It has been demonstrated that loads carried over the shoulders require less energy to move than those carried on the back. This implies that with properly distributed loads donkeys will be less easily tired and use less energy.

The characteristics of a good pack saddle include lightness, durability, balance, correct padding and the absence of protrusions. It should not cause saddle sores or rope burns.

Saddles should ideally be attached with broad straps rather than ropes, to minimize the risk of sores. The belly strap is meant for attachment and should be well forward so as to avoid the flexible ribs of the mid-body that are involved in breathing. If the belly strap is over tightened - particularly if it is not forward - it will impair breathing and tend to tire the donkey. Attention to points of detail such as ensuring the underside of the saddle is free from grit and that the donkey's hairs are lying naturally under the saddle is also important.

If a pack saddle is new it should be 'broken-in'. This involves using light loads and careful observation to ensure that there is no excessive rubbing leading to hair loss and skin damage.

### Correcting pack saddle donkeys

The major problems with pack saddles are saddle sores and rope burns. These are caused by poorly fitting and unbalanced saddles often in association with overloading. Saddle sores are the result of excessive pressure and friction at one point. Early detection of such pressure points is important, and this can be done by checking for rubbing and looking for areas that are especially wet with sweat. These areas will quickly develop into sores if corrective measures are not taken. Conversely, totally dry areas under the saddle suggest that no load is being carried at these points.

Pressure points or saddle sores are treated by removing the pressure and, if necessary, treating the sore by cleansing and applying antiseptic solution or powder. Removing the pressure and simple treatment will encourage natural healing which often occurs quickly in donkeys. Pressure points are released by altering the padding of the saddle or by making a special cup to protect the sore from further pressure.

Once the immediate problem has been tackled attention should be given to the cause of damage: for example, the protrusion on a damaged saddle, unbalanced loading, the use of thin ropes or bad saddle design. Jute sacks are often used as saddle blankets, and when repeatedly wetted with sweat and allowed to dry they can become very stiff and abrasive. The balancing of packs can be aided by breaking down loads into smaller units that can be loaded and balanced more easily. In this regard attention may need to be paid to the whole transport system so that load units are of appropriate size for eventual packing during the last stage of the journey.

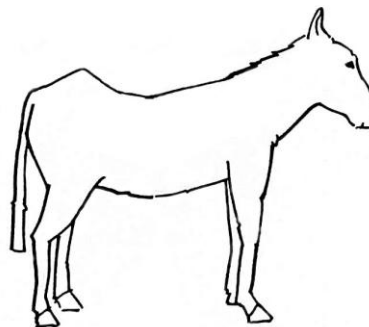
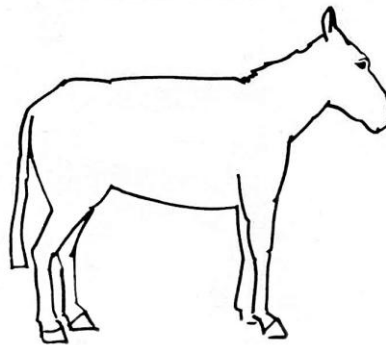


Figure 3: Choose donkeys with straight backs - otherwise the load will slip backwards from the shoulders.

## The future for pack donkeys

The future of donkey pack transport will ultimately be determined by the cost and availability of alternative forms of transport, and the status accorded to donkey owners by the society in which they live. Its future could be influenced, however, by extension and research aimed at improving its efficiency. Extension initiatives might include stimulating owner groups, demonstrations and competitions. Research could be directed to identifying saddle improvements, better nutrition and the breeding of more suitable animals. The local production of pack saddles, possibly using old car tyres, is one area for 'appropriate research'. Pack donkeys were in use before the invention of the wheel and it may be that they will outlast the internal combustion engine with its dependence on non-renewable fossil fuels. Pack donkeys are a real option for the future which justifies greater investigation and attention; not only for reducing the burden on women and children, important as that is, but as a truly appropriate renewable power source for the tropics.

## Bibliography

Anon, *Field Artillery Manual- Pack Artillery (FM6-110)* United States Government Printing Office, Washington, 1940.

FAO, *Report of the FAD Expert Consultation on Appropriate Use of Animal Energy in Agriculture in Africa and in Asia (AGA-806)*, 15-19 Nov. 1982, Rome, 1982.

D. Fielding, 'Donkeys in Africa' Paper presented at a Colloquium on 'The exploitation of animals in Africa' 22-24 March, 1987. African Studies Group, University of Aberdeen, UK, 1987.

R.J. Stibbards, 'The energy cost of carrying loads in pack animals', M.Sc. Dissertation. Centre for Tropical Veterinary Medicine, University of Edinburgh, UK, 1980.

## Further Reading

- [TR37 Twin Wood Plain Bearing Axle for Donkey Carts](#) (1999) 13pp: Low-cost Animal Cart Programme, DTU
- [TR35 Making a flatbit for drilling holes in wood](#) (1999) 4pp: Low-cost Animal Cart Programme, DTU
- H.S. Pearson, C.E. Oram & T.H. Thomas WP43 [African Ox-Cart Design and Manufacture](#), DTU, (1994) 62 pp.
- Coombs, R.M. & Pearson, H.S. *The ITDG wood bearing ox cart*. ITDG/GRZ Project, Magoye, Zambia February 1974
- [Design and Manufacture of Animal Drawn Carts](#) Barwell & Hathaway, Practical Action Publishing
- [Sharing the Load](#) van Dijk et al Practical Action Publishing

Practical Action Technical Briefs [Animal Drawn Carts](#)

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