WHY ARE PIGS (AND SOME OTHER ANIMALS) NOT MILKED?

The pig is an important domestic animal in many parts of the world and in some areas it is the sole mammalian livestock species, yet nowhere does it appear to have been milked. The reasons for this have been of interest to both the present authors, from their different points of view, and they have also been briefly addressed by Marvin Harris in a recent publication (1986: 150-1). This short note considers why this valuable resource, and two others of less apparent value, have not been exploited - a byway of ethnography which may perhaps be of interest also to prehistoric archaeologists and agricultural scientists.

The milking of animals for human consumption seems to have been unknown in pre-Columbian America. In the Old World it is widely practised in environments ranging from tropical to subarctic, but it is absent from much of Africa and the greater part of Southeast and East Asia, though it seems to have occurred there locally and sporadically. Simoons has pointed out that in Southeast Asia, as a result of Hindu and Buddhist influences, and in China, following its conquest by pastoral peoples, there have been periods of milk usage, at least for ritual purposes; but these episodes began early in the Christian era and declined after the eleventh and fourteenth centuries respectively. The areas in which milk and milk products are not used or are used only rarely correspond closely with those in which adults are lactose malabsorbers (Simoons 1980: 83-6).

Except the pig, all the Old World domestic animals that seem to have real potential as milkers have in fact been milked. They are all herbivores and mostly hoofed, the main animals milked coming from the ruminant Sub-order and particularly the Bovidae (see Table 1). Many peoples, both settled and nomadic, milk sheep and goats. Among agriculturalists, animals of the cattle group

Table 1

MILKING AND POTENTIAL MILKING SPECIES AMONG LIVESTOCK

Order:	Artiodactyls (even-toed)		
Sub-order:	Ruminanta, Family Bovidae -	*Bos*	cattle
			Bali cattle (*banteng*)[1]
			gayal (mithan)
			yak
			Asiatic (water) buffalo
		Caprini	goat
			sheep
	Family Cervidae -		reindeer
Sub-order:	Tylopoda, Family Camelidae -		camels
Sub-order:	Suiformes, Family Suidae -		pig[2]
Order:	Perissodactyls, Family Equidae - (odd-toed)		horses
			ass[3]
Order:	Proboscoidea Family Elephantidae -		elephants[4]

[1] Not usually milked; milk production low.

[2] Not milked.

[3] Not regularly milked, probably because better milking species available.

[4] Not milked, but not truly domestic, since no control of breeding.

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tend to be the most important suppliers. Nomadic pastoralists obtain milk also from reindeer, camels and horses and for some it is (at least seasonally) the main source of nutrition. It is consumed principally as butter, cheese, yoghurt and other products, in which forms it can be stored (Ryder 1983a).

Two other less promising candidates are the elephant and the dog. The practical difficulties of milking elephants and their long gestation period present problems too obvious to need elaboration, and the peoples who keep them have other, more easily milked, species. In the case of the dog the small size of most

indigenous breeds and its multiple teats probably provide sufficient explanation. It would have been necessary to maintain a large number to provide a supply of milk. Milking and management would have needed the cooperation of a number of people; confinement and control would have been difficult; in most circumstances they could not forage for themselves; and although dogs (as in Polynesia) can be fed a mainly or wholly vegetarian diet (Titcomb 1969: 9, 25, and *passim*), feeding so many animals to obtain a scanty supply of milk and some meat would probably have been uneconomic.

Most pig-keepers have alternative sources of milk, but in Oceania the pig and the dog were the only domesticated mammals. Since the dog can be regarded as unsuitable for the reasons just suggested, speculation focuses on the pig, which in any case was the only domestic mammal available on some islands. Because of their bulk, pigs might be expected to provide a useful quantity of milk; though not amenable to being driven, they are relatively easily confined and controlled; and they are adaptable as to diet and will forage for themselves.

There are several possible reasons why pigs are not milked: unsuitability of the milk for human consumption; lactose intolerance; failure to observe or to appreciate the possibility; unwillingness due to religious prohibition or simple distaste; and practical difficulties in obtaining the milk.

The first of these can be dismissed. Although, unlike the species which are milked, the pig is omnivorous, its milk is acceptable and is more nutritious than cow's milk (H.B. Parry, personal communication 1979). Lactose intolerance is related to the non-use of milk generally, not only of pig's milk. It seems to be an effect rather than a cause, since the condition is almost certainly not hereditary (Ryder 1983b: 725).

The third reason - lack of appreciation of the possibility - cannot be the reason for the non-milking of pigs in the Old World as a whole, where the milking of other species was widely practised; but it could have been an important, even the decisive, factor in Oceania. In recent times western New Guinea has had considerable contact with the eastern islands of Indonesia, and Indonesian influence has led, for example, to the introduction of iron-working (Kamma and Kooijman 1973). The peoples of eastern Indonesia had potential milking animals, but they rarely or never milked them; whether this has always been so is not known. The Lapita people, who were ancestral to the Polynesians, arrived in the western Pacific in the second millennium BC (Bellwood 1978: 244). It is therefore possible that before they left their Southeast Asian homeland they were in contact with milking peoples, but this too is not known. It is also possible that they possessed the milking trait and lost it in the course of their migrations, as they lost the craft of pottery. So both Melanesians and Polynesians had the pig, and they may possibly in the past have had contact with milkers; but even were the pig a suitable animal for milking, isolation from milkers would perhaps provide sufficient explanation for their failure to do so.

The fourth possibility - prohibition or distaste - also seems unlikely as a decisive factor in the Old World as a whole. Distaste for milking *any* animal is often expressed by non-milkers, who give a variety of reasons (Simoons 1980: 84), but this does not explain why those peoples who milk make an exception of the pig. In Judaism and Islam the pig is regarded as ritually unclean. The basis for this religious taboo is almost certainly not disgust at their scavenging proclivities or their habit of wallowing in mud to reduce body temperature. Neither is it that they are hosts to the parasitic worm *Trichinella spiralis*, which can be transmitted to man: the link is unlikely to have been recognised, and in any case the danger to man from the worm (which is killed by adequate cooking) was not recognised in Europe until 1860 (Douglas 1978 : 30). As long ago as 1952 Coon (1952: 346) suggested that this religious prohibition of pork among Middle Eastern nomads is more likely to have an ecological explanation. Pigs are unattractive to them because they are not easily driven and do not adapt well to the hot, dry conditions. Unlike other livestock, pigs supply little more than flesh, and since pigs can compete with man for food they may threaten the whole subsistence economy (Harris 1976, 1978, 1986), whereas sheep and goats survive on the little food available in the austere environment and provide a wide range of products (Ryder 1983b: 195). Mary Douglas's view, however, is that (to summarize) the Israelites, at least, considered as ritually unclean animals which did not fall clearly within certain categories, the pig being anomalous because it is cloven-hoofed but does not chew the cud; and she also points out that there is in Leviticus no reference to the pig's scavenging habits (1978: 54-7). Later (1972: 78-9), she also suggested that the pig symbolized prohibited exogamy, since it was eaten by neighbouring peoples, intermarriage with whom was forbidden to Israelites.

Whichever reason or combination of reasons provides the explanation, in Southeast and East Asia, where their meat is widely used, such feelings of distaste for pigs are only usual in Muslim areas. In Melanesia in general, and in New Guinea especially, pigs are regarded with affection and treated as family pets until the time comes for their slaughter. Indeed, in New Guinea they are sometimes suckled by women (as were puppies in Polynesia). Their great importance in ceremonial and social life, especially in New Guinea and Vanuatu, has been extensively recorded (e.g. Brown 1978; Layard 1942; Rappaport 1984).

It therefore seems likely that the main reason for the failure to exploit fully the possibilities of the pig is simply the difficulty of doing so. The practical problems are considerable. Pigs lactate lying down, but this is not an insuperable obstacle, because they can be roped to keep them standing. A greater problem is that, as in the dog, the pig has many teats (16-20), which are small and difficult to grip (English, personal communication 1979). But the most important and probably decisive factor is that sows do not 'let down' their milk readily, even to their own young. This happens hourly throughout the twenty-four hours in spells of only about thirty seconds duration. During this short period all the

udder segments would need to be emptied, which would require a number of milkers. Cattle and sheep, by contrast, 'let down' their milk less frequently but for longer periods, and each of their fewer teats provides a much higher proportion of the yield.

Understanding of these difficulties has come from the considerable interest in the composition of sow's milk in connection with studies of pig nutrition (e.g. Colenbrander *et al.* 1967). Not until knowledge of the hormone oxytocin involved in milk 'let down' was obtained was it possible to ease the milking process by injections of the hormone, but even then teams of milkers were required and only one litre of milk was obtained at a milking (R. Braude, personal communication 1983; Braude *et al.* 1947). Later, several types of milking machine were developed for sows, solely for nutritional studies (e.g. Lodge 1957).

It may be that for Oceanic peoples, isolated from milkers by the non-milking parts of Asia, lack of appreciation of the possibility of milking would in any case have explained its absence. However, for the greater part of the Old World the answer to an apparently complicated question seems to be simple: a species difference in the ease of milk 'let down'. A difficulty that today can be overcome (and then only experimentally) by hormonal injections and milking machines would have provided a major deterrent to technologically less advanced peoples, particularly where other animals were available which could be milked more readily.[1]

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