

Notes on weaning and prolonged lactation in Australian Fur-seals (*Arctocephalus pusillus doriferus*) at Taronga Zoo

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INTRODUCTION

Collection of six Australian Fur-seals from Seal Rocks, Victoria, in 1977 led to a breeding programme beginning in 1981 which has produced 10 pups. The captive weaning of these pups has been studied in detail as part of Taronga Zoo's pinniped management and husbandry research programme (Steele *et al.* 1987).

In the wild the lactation period for Australian Fur-seals lasts 11-12 months. Pups are believed to begin foraging by seven months but there is variation in the timing and causes of weaning (Shaughnessy and Warneke 1987). Similarities have been observed in captive pups which have shown increased interest in solid food at five months of age, and even before separation from the mother may supplement their milk diet with small amounts of fish. Within 8-14 days of separation they will eat a minimum of 10% of their body weight equivalent daily.

CAPTIVE WEANING

A summary of three successful methods of captive weaning at Taronga Zoo follows:

Method 1: Separated from the mother and not returned.

Two pups, a female and a male from the 1983 breeding season, were weaned at seven months by separation from the mother. They reached an average daily food intake of 3.5 kg within four weeks of being separated. Another female from the 1985 season was weaned in a similar manner, being eight months old at separation, and was eating 3 kg daily within four weeks. None of these three animals have ever been returned to their mothers.

Method 2: Separated at five months and returned to the mother at 12 months.

A male pup from the 1985 season developed a sickness syndrome (Steele *et al.* 1987). It was separated from its mother and force-fed successfully at five months. The pup reached an average daily food intake of 3.5 kg at six months and was returned to the mother at 12 months,

following the birth of her new pup. Continuous admonishment by the mother towards the yearling (in favour of her new pup) led to successful weaning.

Method 3. Separated from the mother at nine months and returned after four years.

A male pup from the 1982 season, after being weaned at nine months, was returned to its mother at four years of age. No further nursing has been observed.

A CASE OF CONTINUOUS OR INTERMITTENT LACTATION

A male pup born November 25, 1985 was regularly separated from its mother for a total of about half of its first nine months. The separations were an attempt to simulate wild conditions where mothers spend long periods at sea foraging (David and Rand 1986). The separations were generally periods of four to five days, or until the pup's behaviour indicated hunger, e.g., calling or hyperactivity.

When the pup was eight months old, longer separations were begun. Prior to this the pup had shown increased interest in eating fish whilst still with the mother. It had also reached a body weight (32.4 kg) which seemed appropriate to proceed with weaning in view of the fact that successful weaning has been accomplished for both male and female pups from body weights of 21 kg (Steele *et al.* 1987). In mid-July 1986 the pup was placed in a separate holding area, visually isolated from its mother but within audible range. The first separation lasted 77 days, during which time the pup's food intake increased to an average of 3.5 kg daily. This separation and subsequent separations are shown in Fig. 1.

The pup was returned to its mother on October 2. During the following 24 days the pup's food intake remained at about 3.5 kg daily, but the mother's intake increased from five to six kg daily. No suckling was observed and both food intakes remained constant.

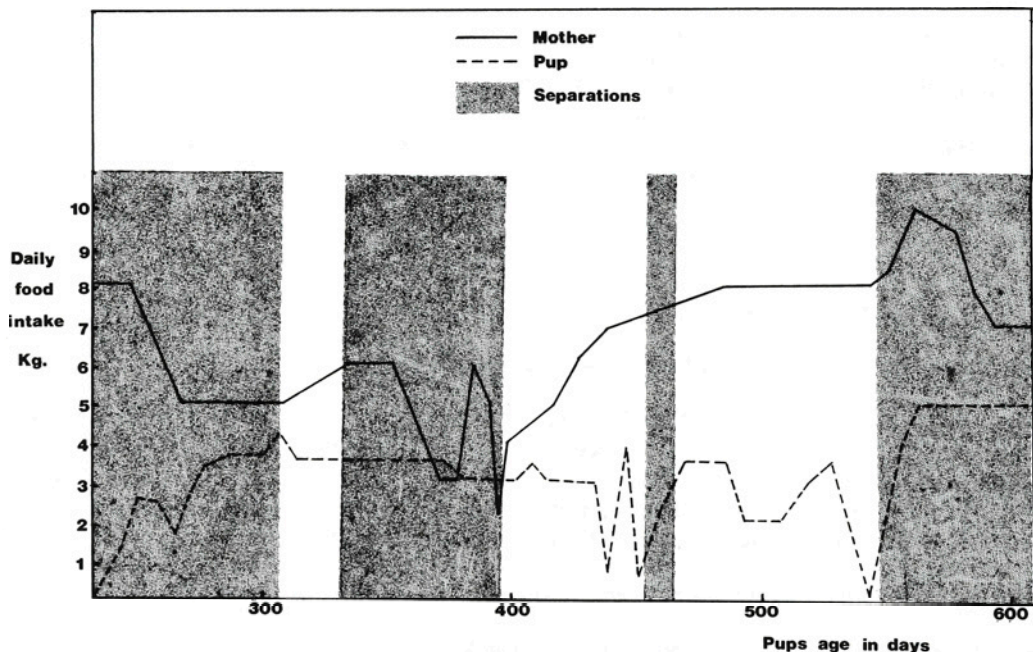


Fig. 1. Food intake of mother and pup during separations that were made after the pup was eight months of age. See text for details.

Late October the mother was moved to another area for mating (she had not mated in 1985 and did not give birth during the 1986 season). During this 48 day separation she was isolated from any external stimuli from pups. Her food intake decreased considerably during mating and moulting (as we have often observed in females at this time) whilst the pup's intake (3 kg daily) was average for a summer diet for an animal of its size. When the mother was returned after mating, the pup was observed suckling almost immediately and during the following two weeks its solid food intake decreased to almost nil.

During a nine-day separation in February 1987, the pup's solid food intake increased to 3.5 kg daily. The pup was returned to the mother on March 2, 1987 and, for the next 78 days, increased suckling bouts were observed. Milk was observed leaking from the right rear nipple during suckling on March 20, 1987. At this stage, with the pup 16 months old and natural weaning not initiated by either the pup or mother, it was decided to separate the animals permanently. After this final separation the solid food intake for both animals returned to normal within the next month, the mother averaging 7 kg daily and the yearling 4.5 kg daily.

It cannot be ascertained whether the prolonged lactation evident in this case was continuous or intermittent. It can only be assumed that lactation was prolonged by the suckling stimulus when the pup was present and perhaps by external stimuli during separation, including the sight and sounds of other mothers and pups. It is also impossible to determine the effect that might have resulted from the fact that the mother did not mate after birth of the pup under consideration and did not give birth in the next season. However, this case record indicates that husbandry methods should take into account the likelihood that long separations, perhaps in excess of 77 days, may be necessary to successfully wean Australian Fur-seal pups. To achieve weaning, such separation must be complete, with the exclusion of auditory or visual stimuli between mother and pup. The role of these stimuli in the conditioning of the milk ejection reflex has been well established (Cowie and Tindal 1971).

DISCUSSION

This paper reports failure of mammary involution to occur over periods of up to 77 days of separation of mother from pup in captivity. This clearly indicates a potential for research into lactation in otariids using captive animals, particularly because it has not been possible to date to determine in the wild how the onset of mammary involution is avoided in female otariids which spend prolonged periods at sea on feeding trips and still suckle young on return (Ofstedal *et al.* 1987).

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