

The Breeding of Dolphins in Captivity in Barcelona Zoo

Salvador Filella, Miguel Luera and Ferran Costa

c/o Zoo Barcelona, Parque de la Guadala, 68003 Barcelona, Spain

The dolphinarium of Barcelona Zoo was opened in 1965 and since then there have been several attempts at breeding, all of them with *Tursiops truncatus*.

We shall now proceed to go through the cases, one by one, and analyse the factors which we consider to have caused the initial failure of breeding attempts and also those which influenced the eventual success.

First Case

A female called Medea, arrived at our zoo on the twenty-fifth of January, nineteen sixty-seven. As a result of the deparasiting treatment, which in those days was given to all dolphins on arrival, she aborted on the tenth of March. The foetus had grown very little and was only two hundred and fifty millimetres long.

Second case

On the tenth of November, nineteen seventy-one, a male dolphin was born to the female Kirma, who had arrived at the Zoo on the twenty-seventh of April, nineteen seventy-one. On arrival she showed symptoms of pregnancy. The dolphin was born at 12.45 in an outdoor enclosure of the aquarium, which has a surface area of 69.25 square metres.

Due to the low temperatures prevalent at that time of year (and to our inexperience) a canopy was erected over the enclosure. However this made the mother very nervous and she began to swim round in circles without stopping, thus offering the new young dolphin *few opportunities* to suckle.

On the eleventh of November, breathing frequency was recorded, with a rate of forty-seven times every quarter hour for the mother and forty-three for the baby. They covered a distance of about four hundred and fifty metres in the same time.

The first attempt to suckle was at six o'clock on the tenth, without success. At 2.15 and 2.45 and again at 4 o'clock, further attempts were made, but the mother was nervous and kept rejecting her offspring's approaches. This pattern continued and observation showed that their behaviour was normal, though both animals were in constant motion and *suckling did not* take place. At ten past one on the

thirteenth of November, breathing frequency was recorded at sixty-one times every fifteen minutes for the mother and fifty-six for the baby, over a distance of four hundred and sixty-eight metres.

The same day, at 10 past 3, for the first time, both mother and young were seen to stop and remain stationary for some time, before resuming with the behavioural pattern described above.

Finally, at 2.30 on the fourteenth, the breathing rhythm changed, with a frequency of fifty-three times per quarter-hour for the mother but a hundred and twenty-four for the baby.

At quarter to nine the baby opened and closed its mouth, kept afloat only with assistance from its mother. At five to nine, it died.

The corpse was measured and a post-mortem was carried out, resulting in the discovery of a haemorrhage in the membrane of the cranial.

CONCLUSION: The enclosure did not provide adequate conditions and the attempt to improve them only excited the mother, with disastrous results for the baby.

Third case

On the twenty-first of September, nineteen seventy-nine a female dolphin was born to Circe, a female that had come to Barcelona Zoo on the twenty-seventh of April, nineteen seventy-one. This is the first case, in which the fertilization takes place in our dolphinarium. The father Hector, had arrived here on the twenty-sixth of October, nineteen seventy.

The birth took place in the covered exhibition enclosure, which has a surface area of about hundred and seventeen square metres. The development of suckling and breathing is normal until the twenty-third of October (thirty-four days), when at 4 o'clock, for no obvious reason, the young dolphin dies.

The corpse is measured and X-rayed and in the post-mortem a general congestion is discovered affecting all organs. Subsequent analysis identifies a SX2†, which has produced a septicaemia. During the period in question the female had been given a treatment of complex vitamins and prolactum*.

CONCLUSION: Despite the inadequacies of the enclosure, development was normal. The death came

Table of measurements for two young *Tursiops truncatus* (Montagu 1828) born in Barcelona Zoo on 10/4/71 and 21/9/79 respectively

Measurements	Baby male: Born 10/4/71 died 14/Ç/71	Baby female: born 21/9/79 died 23/10/79
Total length	1.100 mm	1.180 mm
Length from tip of upper mandible to centre of navel	495 mm	574 mm
Length of pectoral fin	225 mm	233 mm
Width of tail lobes (tip to tip)	205 mm	267 mm
Length of base of dorsal fin	210 mm	185 mm
Length from tip of upper mandible to depression of pectoral fin	270 mm	305 mm
Length from tip of upper mandible to the corner of the mouth	147 mm	160 mm
Length from tip of upper mandible to centre of eye	170 mm	195 mm
Length from tip of upper mandible to apex of adipose panicle of forehead	43 mm	50 mm
Length from centre of eye to ear orifice	30 mm	47 mm

as a surprise to us, due to the lack of apparent symptoms.

Fourth case

On the fifth of November, nineteen eighty a female, called Alicia, was born to Circe and Héctor. She died on the twenty-first of February, nineteen eighty-two, at the age of fifteen months. As the pregnancy was detected at an early stage, for the first time the mother was moved to the large tank (six metres deep, with a surface area of three hundred and eighty square metres). The baby's behaviour was normal in all aspects and she developed perfectly.

When she was moved onto solid food, she suffered from the competition of the male of the group, a new phenomenon for us. Because the mother was producing less milk and at the same time, the young dolphin was reluctant to consume fish, the latter began to lose weight alarmingly. As a result, both mother and baby were moved to the hospital enclosure, where Alicia was force-fed on small sardines with cod-liver-oil. Eight days after beginning this treatment and despite an apparent improvement, the baby died, on the twenty-first of February, nineteen eighty-two.

In the post-mortem we discovered injuries in the oesophagus and an accumulation of fishbones in the stomach.

Samples of the lungs, spleens, kidneys and liver showed them all to be perfectly normal.

CONCLUSION: When the baby was moved onto solid food, competition with the male and unsuitable techniques of force-feeding prevented the animal from feeding properly.

Fifth case

On the twenty-ninth of June, nineteen eighty-two, a female was born to Nika and Hector, in the large tank. She dies immediately after birth due to a congenital malformation of her tail vertebrae, which made it very difficult for her to swim. The body was X-rayed.

Sixth case

Inuk was born on the twentieth of September, nineteen eighty-three to Circe and Triton.

She was born at 7 o'clock in the large tank. When she was five months old, the male was withdrawn from the tank, to avoid the problems caused by competition, when she was moved onto solid food. We must also point out that during Inuk's development Ulysis, a young male killer-whale, had been in the tank with mother and baby, proving an excellent playmate for the young dolphin and contributing a great deal to the fact that she had developed normally and happily with us.

CONCLUSIONS: Judging from our experience, the depth and surface area of the tank are of great importance; the change to solid food must be made when demanded by the young dolphin and, in this there must be no interference from other members of the group. Solid food must be varied and small, e.g., the young of salmon and hake, squid, mussels.

A table of measurements is appended (Table I).

This report has been compiled by Salvador Filella, Miguel Luera and Ferran Costa.

*Nicotinamide, 200 mgms by Casen Laboratory, Barcelona
†Staphylococcus type × 2.