

Case Study: Surrogating Degu Pups

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On 31st March, 2008 a pregnant female from the Degutopia colonies went into labour with a first litter around 13:00 hrs, and produced three pups within the first 3 hrs of contraction onset. Two pups appeared normal and healthy, while the third pup had developed abnormally and suffered extensive brain damage resulting in death within 48 hrs. Despite continued contractions and visible straining attempts to pass further pups, no more pups were born overnight or the following morning of the 01st April, and the female was taken for an emergency c-section to extract any remaining pups. In order to prevent stress to the newborn pups, during the mother's operation they were placed with an unfamiliar, surrogate female in an adjoining colony. This colony consisted of two adult, non-lactating females and one adult lactating female who had previously given birth to 7 healthy pups 5 days previously. Newborn pups were placed directly in the nest with the surrogate mother's pups, where they were accepted without issue after receiving extensive grooming care from the adults. This was done to ensure the pups were kept warm (pups less than 8 days old cannot self-thermoregulate) and had access to milk (pups aged between 0-14 days require suckling approximately every 2 hrs) and grooming care (pups must also receive ano-genital stimulation to produce waste after feeding). During surgery, the female was found to have an abnormally large, deformed foetus obstructing the birth canal, thus preventing passage of the remaining pups. Further investigation revealed that the female had abnormalities within the ovaries, and this may have been a cause of the abnormal foetal development. The decision was made to spay the female to prevent further problems caused by the ovaries, and prevent further pregnancies. The abnormal foetus was removed along with two remaining pups, one healthy and one with extensive brain damage similar to the one original pup passed (again this pup did not survive longer than 48 hrs). The mother came round post-surgery quickly and without issue, and was returned to her colony along with the newborn pups shortly after. Upon her return, the pups placed with the surrogate mother were also returned to their mother along with the newborns, since there would be less competition for milk in their mother's colony. Despite being well, the female was no longer interested in caring for the pups after surgery, and refused to remain in the nest to allow the pups to suckle (although the pups were kept warm and groomed by other colony members). The female was left overnight to recover, but the following morning of the 02nd April the decision was made to surrogate all the pups back with the previous colony to allow the pups to feed and give them the best chance of survival. The pups were transferred directly from the nest into the nest of the surrogate female, and again were accepted without issue after extensive grooming care. This resulted in a total litter size of 10 pups (7 original pups plus the three healthy pups from the surrogated litter). This presented a problem since female degus have only 8 teats, and the 7 older pups were larger and stronger than the new arrivals, so there was concern as to whether the younger degus would have access to enough milk to support their growth. It was decided a milk supplement should be used in addition to separate feeding sessions with the lactating female in the regime as follows:

- 09:00 hrs – Youngest pups receive milk supplement by hand feeding
- 11:00 hrs – Youngest pups separated with surrogate mother for individual feeding session
- 14:00 hrs – Youngest pups receive milk supplement by hand feeding
- 17:00 hrs – Youngest pups separated with surrogate mother for individual feeding session
- 19:00 hrs – Youngest pups receive milk supplement by hand feeding

Milk supplement was provided in the form of Sherley's Lactol, a lactose-free milk powder designed for hand-rearing puppies, kittens, guinea pigs and rabbits and with a formula suitable for degu pups. 1 teaspoon of Lactol was dissolved in 30 ml of warm water and allowed to cool to body temperature (as determined by a drop of formula onto the back of the hand). Formula was given via teat feeding bottle also supplied by the same company, and a small hole suitable for degu pups was made in the teat using a needle. During feeding, the

bottle was kept warm by returning to a cup of warm water when not in use. Pups were allowed to suckle from the teat in a chewing motion, but in some cases did require a small amount of formula to be squeezed into the mouth before suckling would begin. Pups were allowed to suckle until they became full; The time/quantity of this varied depending on the time since they were last able to suckle from the surrogate mother. The two male pups in particular seemed to drink more, more readily, than the female pup in each session. The individual suckling sessions with the surrogate mother were undertaken by placing a small cage (~30 x 50 x 40 cm) onto a hot water bottle to maintain a warm environment, then placing the three youngest pups and the surrogate female into the cage. The female was provided with ~7 g of hard feed to consume inside the cage, and this meant the pups could easily suckle from her while she remained still to eat. Each session lasted approximately 10 minutes, and the pups and female were returned to the colony cage immediately after (the other 7 pups were cared for by the other adult females during this time). This routine was continued for the first 2 weeks post partum for the youngest pups, after which time the hand feeds were stopped but the individual suckling sessions were continued until week 3 when the pups began eating more solid feed. All 10 pups were weighed daily for the first 2 weeks and then weekly until weaned at 6 weeks, in order to ensure pups were growing at a normal rate and to check each pup was getting enough milk (pups grow at a typical rate of 2 g per day over the first 2 weeks). The original 7 pups suffered no ill effects in growth rate or development caused by the extra competition of the 3 surrogated pups. The 3 surrogated pups grew at a steady rate, but put on slightly less weight overall than would normally be expected, due to the competition from the older pups. However, due to the strict supplementing regime, all 3 pups were healthy and were successfully weaned at an acceptable weight at 6 weeks old, the age at which pups are typically weaned. The original mother recovered completely within 2 weeks of surgery with no lasting complaints.

For further information regarding surrogating degu pups, hand rearing and pup growth rates, please contact degutopia@btinternet.com.