

# White rhino husbandry training, ultrasound and research at Hamilton Zoo

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## Abstract

With a recent focus on research and advances in monitoring tools such as ultrasound, a consistent and comprehensive animal training program is an essential tool for the management of rhino.

In early 2008 Hamilton Zoo began performing regular rectal ultrasound exams of our 3 adult female white rhino, in conjunction with our longstanding faecal hormone monitoring program. This monitoring has shown some interesting results:

- Evidence of a regular seasonal anoestrus period in one female
- An early pregnancy slippage confirmed by ultrasound – without the ultrasound exam we would have missed this conception and assumed this was an example of an abnormal ‘long phase’ reproductive cycle
- A long period of anoestrus followed by a spontaneous restart of a reproductive cycle and subsequent conception

This year we have also been heavily involved in Beaux Berkeley’s study into the relationship between nutrition and sex determination. This research required half-day sessions monitoring blood glucose levels, with multiple blood collections from each rhino.

Critical to these projects is a consistent husbandry training program. Maintaining white rhino at a good level of comfort in a training chute enables these tractable animals to be conditioned relatively quickly to accept sometimes invasive or complicated procedures.

## 1. Husbandry training

Since their arrival in 1999 all white rhino at Hamilton zoo have had some form of daily husbandry training. The programs current focus is to maintain a high standard of basic training on which more specific behaviours can be built as required.

Training includes

- Desensitising to numbers of people, vehicles and machinery moving around them while closed into the training chute
- Regular hosing and scrubbing sessions
- Backing up away from gates on voice cues
- Tourniquets applied to ears routinely and periodic blood draws
- Holding up feet
- Taking hormone monitoring faecal samples direct from the animals rectums

It is essential that we keep this training as a core part of the daily routine. This ensures the animals are well used to accepting a variety of procedures in the crush, and that learning and responding to cues are a normal part of their lifestyle.

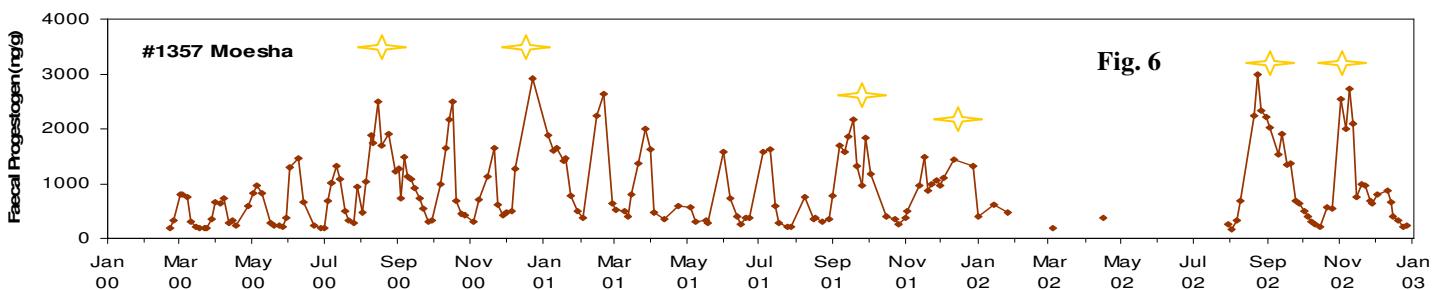
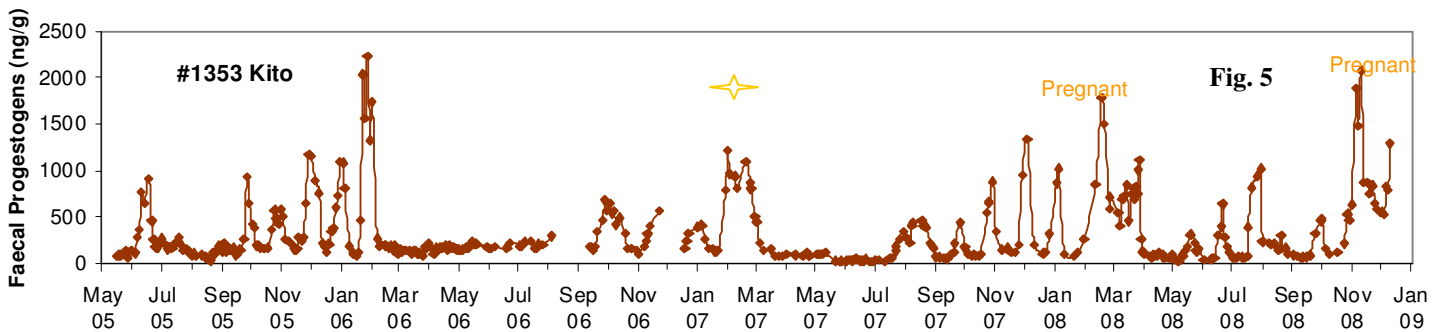
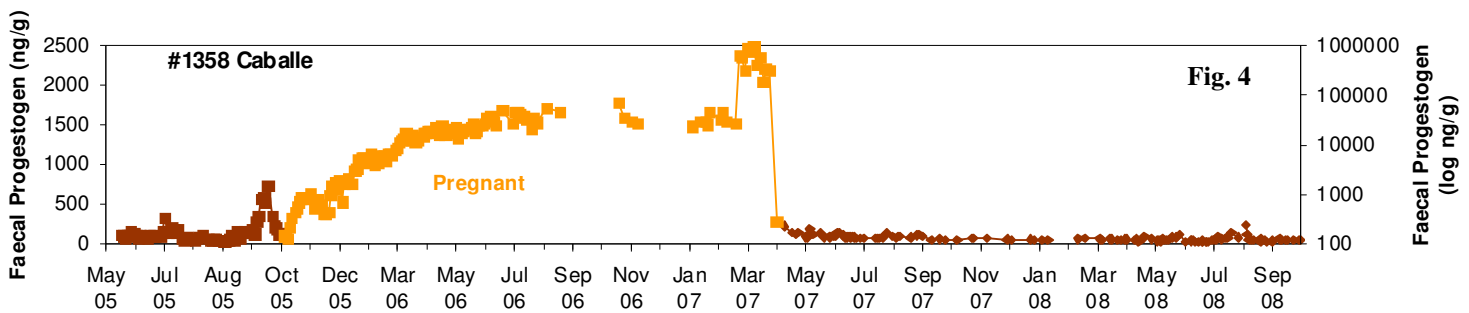
As a result of this husbandry training we have been able to participate fully in the recent study by Beaux Berkeley (Victoria University) into circulating blood glucose, as part of her thesis investigating birth sex ratio bias. This involved several days' worth of serial blood sampling (every 30 to 40 mins) from every adult rhino to study the changes in blood glucose over time. All animals participated well in every session.

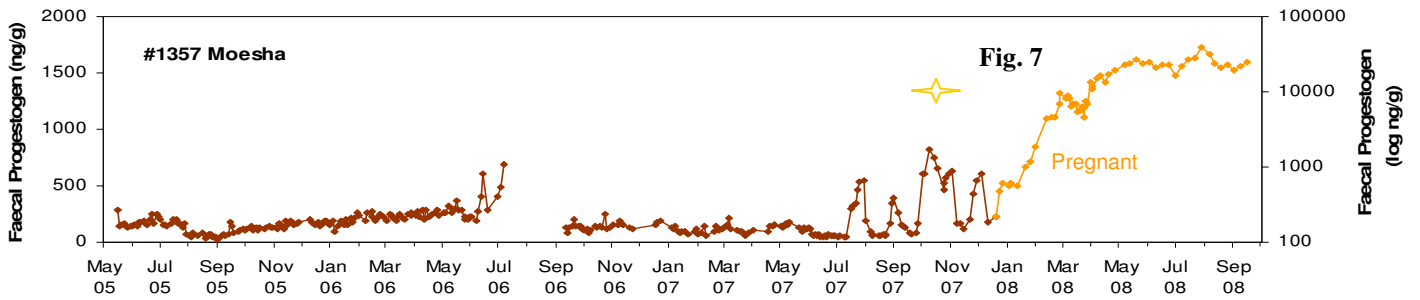


**Figures 1-3: Routine daily husbandry training including tourniquet applied to ear, hosing and evacuating faeces from rectum.**

## 2. Faecal hormone monitoring

Ongoing hormone profiles have been kept on all female rhino since each arrived at Hamilton zoo (see examples below). To date this information has been used to confirm and monitor several pregnancies, track periods of anoestrus and the restart of cycles, and investigate ‘long-phase’ (60 – 75 day) oestrus cycles. Matching our faecal hormone profiles with what we physically saw in rectal ultrasound exams, we noticed that what we would have considered a ‘long-phase’ cycle in studbook 1353 ‘Kito’ in February 2008 actually coincided with an early pregnancy loss (Fig 5). This led us to consider the possibility of other long cycles such as those seen in the first 3 years after arrival in studbook 1357 ‘Moesha’ being undetected early pregnancy losses also (Fig 6).





**Figures 4-7: Faecal progesterone profiles for individual females.**  Indicates long-phase cycles. Pregnancy concentrations are on log scale.

### 3. Ultrasound exams

In July 2007 we began a transrectal ultrasound project for all our females, with the initial aim of investigating the anoestrus status of studbook 1357 ‘Moesha’. With the arrival of a new male and a change in management, this female spontaneously started cycling again and conceived that year (Fig 7). Our focus then changed to monitoring pregnancies and further developing local skills in rhino ultrasound towards viewing the whole reproductive tract. Animal training for this process involved desensitising the animals to having faeces evacuated from their rectums, then a gloved arm and a model ultrasound probe inserted into their rectums. We also mocked up a box to look like the ultrasound screen, and ensured there was a variety of equipment and people around the area as there would be on the day. All three rhino females proved quick to condition to this process and we were soon able to perform regular ultrasound exams on all three.



**Figure. 9: Ultrasound exam in progress.**



**Figure. 10: Ultrasound still photo of 57 day old rhino foetus.**

#### **4. Conclusions**

A consistent training program should be a routine part of White rhino husbandry in this region. This benefits the animals as enrichment, maintains health monitoring and the potential for early intervention if necessary, and enables more specific procedures or behaviours to be introduced easily when required.

A training program should include desensitising the animals to a variety of stimulation around the training area, and to changeable routines and people. Include visitors, students, volunteers etc during training sessions; allow vehicles, machinery and other work to continue in the near vicinity, gradually building up the levels the animals are comfortable with.

The opportunities and requirements for research in this species are ongoing and varied. As responsible animal managers we should be ready to participate in relevant opportunities for advancing our knowledge and improve our management techniques.

Combining two monitoring techniques (faecal hormone profile and ultrasound) has given us a clearer view of some female's reproductive cycles. One event we would have classed as a long phase cycle appeared instead to be an early pregnancy loss, and leads to the suggestion that other long phase examples detected may be similar events.