

## BRIEF REPORTS

# Growth Rate of 21 Captive-Born, Mother-Raised Cheetah Cubs

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This paper presents the growth rate of 21 clinically normal, mother-raised, captive cheetah cubs from birth through 45 days of age. The development of a growth curve for healthy, mother-raised cheetah cubs provides a diagnostic tool for individuals involved in cheetah propagation. Use of the curve may alert caretakers to problems early and thus help reduce the high neonatal mortality rate seen in captive-born cheetah cubs.

The growth curve was constructed using 21 (11 males and 10 females) captive-born cheetah cubs from six litters (offspring of three unrelated adult males and three unrelated adult females) born at the Columbus Zoo from September 1985 through December 1989. Each cub was weighed to the nearest gram the morning after birth and approximately the same time every consecutive morning for 45 days. The mean weight the morning after birth was 463 g (range 385–542 g). The average litter size was 3.5 (range 2–4,  $n = 6$ ). The daily weight gain was 40–50 g/cub/day.

**Key words:** *Acinonyx jubatus*, growth curve, pediatrics

## INTRODUCTION

Cheetahs [*Acinonyx jubatus*] are an endangered species which have not bred well in captivity (Marker, 1989). Those institutions which have successfully bred cheetahs in captivity have experienced neonatal mortality rates approaching 50% [Grisham, 1989]. Causes for the infant mortality include premature birth, hypothermia, and acute sepsis [Marker, 1989]. The growth rate of felids has been studied extensively [Gittleman, 1987; Binczik and Reindl, 1987] but information on cheetahs is sparse [Manton, 1970].

The growth of the domestic cat (*Felis sylvestris*) has been studied extensively [Loveridge, 1987]. Changes in body weight are commonly used as one measure of general health in growing kittens. Mortality in domestic kittens has been negatively correlated to birthweight [Haskins, 1990].

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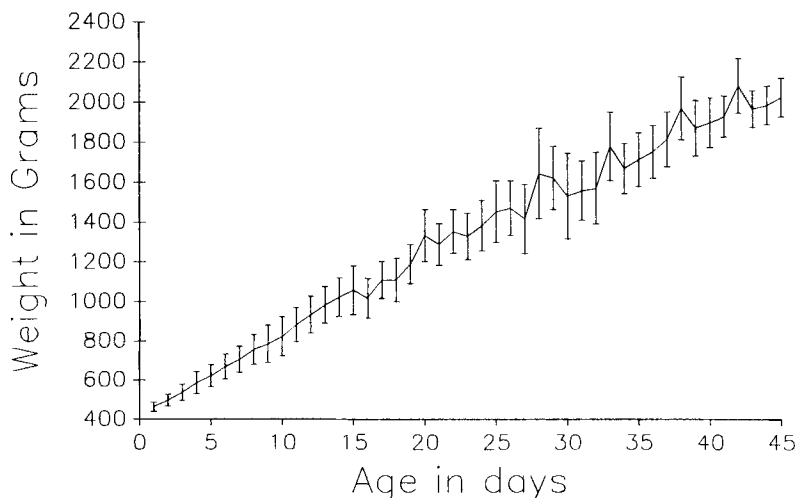


Fig. 1. Growth rate of 21 mother-raised cheetah cubs. Mean, error bars = 95% confidence interval.

The development of a growth curve for healthy mother-raised captive cheetahs would provide a diagnostic tool for individuals involved in cheetah propagation. Deviation of a cub from the growth curve may signal the presence of a medical problem [Binczik and Reindl, 1987]. Early recognition of medical problems may help reduce neonatal mortality in cheetah cubs.

## MATERIALS AND METHODS

Twenty-one captive-born cheetah cubs were weighed to the nearest gram once a day between the hours of 9:00 am and 10:00 am. All cubs were mother raised through weaning and survived to at least 1 year of age. Each cub was weighed beginning the morning after birth and continuing for the next 44 consecutive days. The 21 cubs (11 males, 10 females) represent the offspring of three unrelated adult males and three unrelated adult females. The six litters were born between September 1985 and December 1989 at the Columbus Zoo.

## RESULTS

The growth of 21 mother-raised cheetah cubs is presented graphically in Figure 1. The mean cub weight the morning after birth was 463 g with a range of 385 to 542 g. Average daily weight gain ranged from 40 to 50 g per day. The average litter size was 3.5 (range 2–4,  $n = 6$ ).

## DISCUSSION

The mean cub weight of 463 g is significantly greater than 287.5 g as reported by Oftedal [1987]. Oftedal makes no reference to the sample number or whether the birthweight pertains to captive or wild-born cubs. The elevated mean initial weight

may be the result of the fact that cubs were captive born and weighed 12–24 hr after birth.

The average litter size in this study (3.5) is in agreement with Oftedal's finding of 3.8 cubs per litter [Oftedal, 1987]. The daily weight gain of 40–50 g per day supports Gittleman's reported daily gain of 50 g per day [Gittleman, 1987]. Eight of the 21 cubs lost weight during the first 48 hours. After 48 hours, cubs gained weight every day during the 45 day study.

Although information is lacking on exotic felids, reproductive energetics have been well studied in the domestic cat [NRC, 1986; Loveridge, 1986, 1987]. In the domestic cat, kitten weight is statistically related to sex of the kitten and weight of the dam, but kitten weight is not related to litter size or weight of the tom [Loveridge, 1987]. In this study there was no statistically significant difference in the weights of cubs from different litter size (Kruskal-Wallis test;  $P > .45$ ) nor was there any difference in weight between male and female cubs (two sample t test;  $P > .15$ ) despite the fact that mature male cheetahs (48 kg) are larger than mature females (38 kg). The lack of weight difference may be due to the small sample size (21) or may be that the difference in weight does not occur until later in life (after 45 days).

The development of a growth curve for normal, captive-born, mother-raised cheetah cubs should aid in the management of this endangered species. Decrease in growth rate is an early sign of most medical problems in the neonate (Haskins 1990). By monitoring the growth rate of captive-born cheetah cubs problems can be identified and treated early, reducing the current high mortality rate of captive-born cheetah cubs.

A data collection form is available from the authors. This form can be used to monitor the growth rate of mother- or hand-raised cheetah cubs at any institution. Caretakers are requested to send copies of the completed data collection form to the authors to expand and refine the growth curve data base. Future refinements will include the development of a growth curve for hand-raised cheetah cubs.

## CONCLUSIONS

1. The mean cub weight the morning after birth was 463 g.
2. Cub weights ranged from 385 g to 542 g the morning after birth.
3. Daily weight gain was 40–50 g per day.
4. Average litter size was 3.5, range 2–4,  $n = 6$ .

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