

# Questionnaire-based survey of parturition in the queen

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## Abstract

The lack of scientific data concerning whether parturition in the queen proceeds normally or not may prevent veterinarians and cat owners from recognizing parturition problems in time. A questionnaire-based study of parturition in 197 queens was performed to determine several parameters of parturition and their influence on its progress. The mean length of gestation was 65.3 days (range 57 to 72 days) and it decreased with increasing litter size ( $P = 0.02$ ). The median litter size was 4.5 kittens (range 1 to 9), with more males (53%) than females (46%) ( $P = 0.05$ ). Sixty-nine percent of the kittens were born in anterior presentation and 31% in posterior presentation, indicating that either can be considered normal in the cat. Males were born in posterior position (34%) more often than females (26%) ( $P = 0.03$ ). The mean birth weight was 98 g (range of 35 to 167 g) and decreased with increasing litter size ( $P < 0.01$ ). Mean birth weight was higher in males and kittens born in posterior presentation ( $P < 0.01$ ). Forty-four (5%) of the 887 kittens were stillborn. This was not correlated with the presentation at expulsion but stillborn kittens were more often female ( $P = 0.02$ ) and weighed less than those born alive ( $P = 0.04$ ). The median interkitten time was 30 min (range 2 to 343 min) and 95% were born within 100 min after expulsion of the preceding kitten. The interkitten time as a measure of the progress of parturition was not influenced by the kitten's gender, presentation at expulsion, birth weight, or stillbirth, or by the parity of the queen. The results of this study can be used to develop reference values for parturition parameters in the queen, both to determine whether a given parturition is abnormal and as the basis for a parturition protocol.

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**Keywords:** Length of gestation; Birth; Interkitten time; Cat

## 1. Introduction

Veterinarians and cat owners should be familiar with the normal course of parturition in the queen in order to recognize problems in parturition and be able to intervene adequately to reduce perinatal losses. Because of the relative lack of scientific information about the physiology of late pregnancy and parturition, evidence-based decision making is difficult for both cat owners and veterinarians.

A few of the parameters of the outcome of parturition in the queen have been studied, including mean birth weight, gender, interkitten time, and litter size [1,2,3], but only one study has been based on a large numbers of parturitions [4]. None of these studies investigated the influence of the above parameters on the progress of parturition. Furthermore, the influence of other parameters on the progress of parturition, such as the relative proportion of expulsions in anterior or posterior presentation, has to the best of our knowledge never been described.

The aim of this questionnaire-based study was to determine several parameters concerning parturition in a large number of queens, including length of gestation, litter size, the percentage of anterior and posterior pre-

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sentations during expulsion, interkitten time, gender and birth weight of the kittens, and percentage of stillbirths. Interbreed differences and the influence of these parameters on the progress of parturition were also determined.

## 2. Materials and methods

### 2.1. Questionnaire

Data were obtained by means of a questionnaire sent via websites to several cat breeders. Some breeders also provided data on previous parturitions. Of the 292 questionnaires returned by 123 breeders, 197 were suitable for analysis. Thirty-three were excluded because of insufficient data, 6 because oxytocin was used at the onset of parturition, 3 because parturition occurred at less than 57 days of gestation, 13 because caesarian section was performed, 3 because 3 or more kittens (or more than 40%) were stillborn, and 37 because an

earlier parturition in the same queen had already been described. If oxytocin was administered after birth of the first kitten, all data on interkitten time were excluded. If data on more than one parturition per queen were provided, only one set was used. The 197 questionnaires were obtained from 116 breeders and concerned 887 kittens. The breeder was instructed to enter nothing if a question could not be answered with certainty. Only the submitted data were used and if a comparison was influenced by missing data, it was omitted from calculations.

### 2.2. Animals

The 197 queens represented 29 breeds. Because the numbers per breed were too small for statistical analysis, they were classified into 5 groups of closely related breeds [5] (Table 1). This resulted in a Maine Coon group, a British Shorthair group, an Abyssinian group, an Oriental group, and an other breeds group. The age

Table 1

The breed groups, based on genetic relationships reported by Menotti-Raymond et al [5].

Group	Name of group	Breed	Number of queens per breed	Number of queens per group	Median age of queens per group (months)	n	Median parity of queens per group	n
1	Maine Coon	Maine Coon	28	52	33.0 ± 17.9	49	2.0 ± 1.2	45
		Norwegian Forest Cat	22					
		Siberian Forest Cat	2					
2	British Shorthair	Persian	6	50	32.0 ± 22.6	47	2.0 ± 1.6	45
		Exotic Shorthair	2					
		Selkirk Rex	6					
		British Shorthair	31					
		British longhair	3					
		Chartreux	2					
3	Abyssinian	Abyssinian	8	24	22.5 ± 7.6	24	1.0 ± 0.34	23
		Somali	6					
		Sphinx	4					
		Devon Rex	1					
		Ragdoll	5					
4	Oriental	Bengal	8	54	25.5 ± 19.7	48	1.0 ± 1.2	51
		Ocicat	3					
		Burmese	10					
		Tonkineze	2					
		Balinese	4					
		Siamese	2					
		Thai Siamese	8					
		Oriental Shorthair	9					
		Birman	8					
5	Other breeds	Turkish Van	3	17	33.0 ± 13.7	15	1.0 ± 0.6	13
		Turkish Angora	4					
		Russian Blue	5					
		Snowshoe	1					
		Pixiebob	1					
		European Shorthair	3					
Total				197	28.0 ± 18.8	183	1.0 ± 1.3	177

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