**Structured Data Analysis #7**

The reticulated python (*Python reticulatus*), a species of snake, consumes rats as part of its diet. The graph shows changes in the proportion of rats in the diet of male and female reticulated pythons from southern Sumatra as the length of the snake increases.



[Source: R Shine, *et al.*, (1998) *Functional Ecology*, **12**, pages 248–258]

(a) Identify the relationship between the proportion of diet composed of rats and the length of female pythons.

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**(1)**

(b) Compare the feeding preferences of female and male pythons of lengths between

(i) 100 and 300 cm;

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**(1)**

(ii) 300 and 400 cm.

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**(1)**

(c) Suggest **two** reasons for the differences in feeding preferences of the pythons as length increases.

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**(2)**

 The snakes were bought at local markets and skinning factories in Sumatra. Therefore, the origin of the individual snakes was not known. Estimations about prey size and species were made from fur and skeletal remains in the gut of the snakes.

(d) Suggest **two** factors that could influence the reliability of the results of this investigation.

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**(2)**

**(Total 7 marks)**

(a) proportion of rats in diet decrease with length / inversely proportional /
negative correlation 1

(b) (i) no / little difference 1
*Do not award marks to responses just stating values.*

(ii) proportion of rats in diet of females is lower than for males 1

(c) larger snakes eat larger prey;
feeding frequency can be reduced if larger prey is eaten;
females shift earlier to larger prey to prepare for gestation;
larger snakes move to different habitats;
larger snakes may not be able to catch rats; 2 max

(d) sample is biased / 22 females versus 13 males, so results not reliable;
small sample size;
no males collected above 400 cm;
time and date of capture not known;
seasonal change in feeding patterns;
smaller males more active in foraging therefore greater chance of capture;
not all snakes had full stomachs at the time of capture / prey
availability not known;
some snakes may have been kept in captivity / artificial or forced diet;
larger prey takes longer to digest / rats are digested more quickly;
snakes collected or captured in different habitats; 2 max

**[7]**