

Jaws

[Science](#), [Biology](#)



Jaws Case Study Question The relationship between sarcomere and the tension generated by a muscle is that the sarcomere the amount of tensions a fibre produces is dependent on the length of the fibre. The more the sarcomeres, the more the tension generated by the fibre. A muscle that is long and thick has more sarcomeres and, therefore, produces a stronger bite. A long mandible produces a stronger bite as the masseter and temporalis are longer compared to shorter mandibles that produce less biting force. If the height of the ramus is bigger and more inclined, the biting force is greater than when the ramus is shorter and less inclined (Burrows and Nash 30).

Question 2

C. jacchus and C. pygmaea exhibit longer masseter and temporalis muscles. They also have higher fiber to muscle mass ratio. They have a greater excursion potential of distal tendons hence the muscle can stretch further. The more fibres in C. Jacchus and C. Pygmaea lead to wider jaw gapes and hence can offer more power during gouging (Campbell 25). They also have shorter angle of pinnation, larger PCSA as well as a smaller proportion of tendons. S. Oedipus has a greater tendon proportion as compared to common marmoset masseter. Hence, S. oedipus has a lower muscle excursion and a lower contraction velocity leading to shorter stretching and hence smaller gapes. It also has a greater pinnation angle and a smaller PCSA. They, therefore, produce a smaller biting force as compared to C. jacchus and C. pygmaea. (Garber, Estrada, Heymann and Strier 208).

Question 3

Reference at the work cited page

Question 4

Burrows and Nash (10), explains that the lateral pterygoid muscle in *C. pygmaea* and *C. jacchus* gives them a wider gape. They also found no difference in the anteroposterior ratios of both species. There is little to suggest that these mammals have undergone a reorganisation of the structures of the soft tissue. Kilgore et al (11) suggest that *C. pygmaea*, *C. jacchus* and *S. oedipus* have evolved significantly to adapt to their mode of feeding.

Question 5

Both the new literature cited and the course work books agree that *C. pygmaea* and *C. jacchus* are able to have a wider jaw gapes than *S. oedipus*. This has influenced their feeding habits as well as their diet. *C. pygmaea* and *C. jacchus* have a long mandible that enable it produce a stronger bite as the masseter and temporalis are longer as compared to the latter's shorter that are short (Lord 56).

Question 6

In both, the course work and outsourced materials show no inconsistency in information offered.

Question 7

Future clinical investigations should aim to establish whether muscles have an optimal length that, therefore, produces optimal biting force. Also, investigations should look into the positions of the stretched muscles and its overlap as it operates in vivo.

Question 8

The above scientific investigation should be carried out in a primate

investigation facility. I rate my answers as a 4/5.

Question 9

If I had to do the assignment again, I would outsource information from interviews with primate researchers.

Works Cited

Burrows, A. M. & Nash, L. T. *The Evolution of Exudativory in Primates*. New York: Springer. 2010.

Campbell, C. J. *Primates in Perspective*. London: Oxford University Press. 2011.

Garber, P. A., Estrada, A., Heymann, E. W. and Strier, K. B. *South American Primates: Comparative Perspectives in the Study of Behaviour*. New Year: Springer Press. 2008.

Jurmain, R., Kilgore, R. & Trevathan, W. *Introduction to Physical Anthropology*. Cengage Learning. 2011.

Lord, R. D. *Mammals of South America*. New York: John Hopkins University Press. 2007.