

How rare is a white kiwi?

Investigation Brief

The staff at Pukaha-Mount Bruce were amazed in 2011 when a white kiwi chick hatched. This was not an albino kiwi (a condition of no pigmentation) but a North Island Brown Kiwi with white feathers.



Since then, two more white kiwi have also hatched. Pukaha-Mount Bruce runs a kiwi conservation programme and has brought 30 kiwi from Little Barrier Island to support this programme. White kiwi have also been reported in that population but they are extremely rare.

How probable is it that further white kiwi will be hatched at Pukaha-Mount Bruce?

The genes of its parents determine the colour of a kiwi's feathers. The gene for brown feathers is dominant and the gene for white feathers is recessive. In order for a kiwi to have white feathers both its parents must carry the "rare" gene. Even then there is only a chance that a chick will have white feathers. Find out how this genetic trait is passed from one generation to the next and create a diagram that shows the chance of a white kiwi hatching.

Use a table or tree diagram to represent your findings about how genetic traits are passed on. Try to show the concept of "rare" by diagramming a population such as that of the kiwi at Pukaha-Mount Bruce. How do you express this diagram in numbers (percentages, fractions etc)?

How will the introduction of more white kiwi to the population in Pukaha-Mount Bruce change the probability of hatching white kiwi?

Resources

- calculator
- pencil and paper
- access to internet.

Prompts and Suggestions

Are there equal chances that any kiwi may mate with another, or are kiwi likely to mate for life? How does behavior influence the probability of a recessive trait occurring?

What does "rare" mean in numbers?

What could staff at Pukaha-Mount Bruce do to improve the chances of more white kiwi hatching?

White kiwi genetics

- The North Island brown kiwi species has a dominant brown gene.
- Both the male and female must carry the recessive white gene to produce a white chick.
- There is a one-in-four chance of such a pair producing a white chick (options are BB = brown, Bw = brown, wB = brown, ww = white).
- If two white birds breed, they will only produce white chicks.
- To grow a population of kiwi requires a survival rate of greater than 25% among chicks. The Pukaha breeding programme ensures a survival rate far exceeding this (better than in the wild) by hatching and rearing chicks in captivity, for subsequent re-release to the wild forest as nearly-adult birds.

<http://www.pukaha.org.nz/a-third-white-kiwi-makes-early-white-christmas-present>

<http://www.3news.co.nz/VIDEO-Rare-white-kiwi-released/tabid/423/articleID/316464/Default.aspx>

Extensions

Research the white kiwi population at Pukaha. Investigate whether there are other rare genetic traits in kiwi or other birds in their breeding programmes. Investigate the occurrence of other rare traits in a species. Think about ways that genetic testing could be used to increase and decrease certain traits. How does the concept of “rare” get represented in myth and legend?

The Ghost Bear



http://en.wikipedia.org/wiki/Kermode_bear