

# The effects of feralization on behaviour and brain composition in the feral chickens of Kauai, Hawai'i

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## What happens when domesticated animals escape and are exposed again to the wild?

On the island of **Kauai**, feral chickens have been roaming around since the escape of domestic chickens around the late 1980's. They offer a unique model to understand adaptation, as the population has undergone **introgressive hybridization** between **domestic chickens** and **native Red Junglefowl**, their ancestral counterpart. Studying the feral population can therefore reveal how selective forces have acted and what traits are favoured when animals are exposed again to the wild.

## Aims

The aim of this study was to investigate **fear-related behaviour and brain composition** of this feral population, and compare it to domestic chickens.

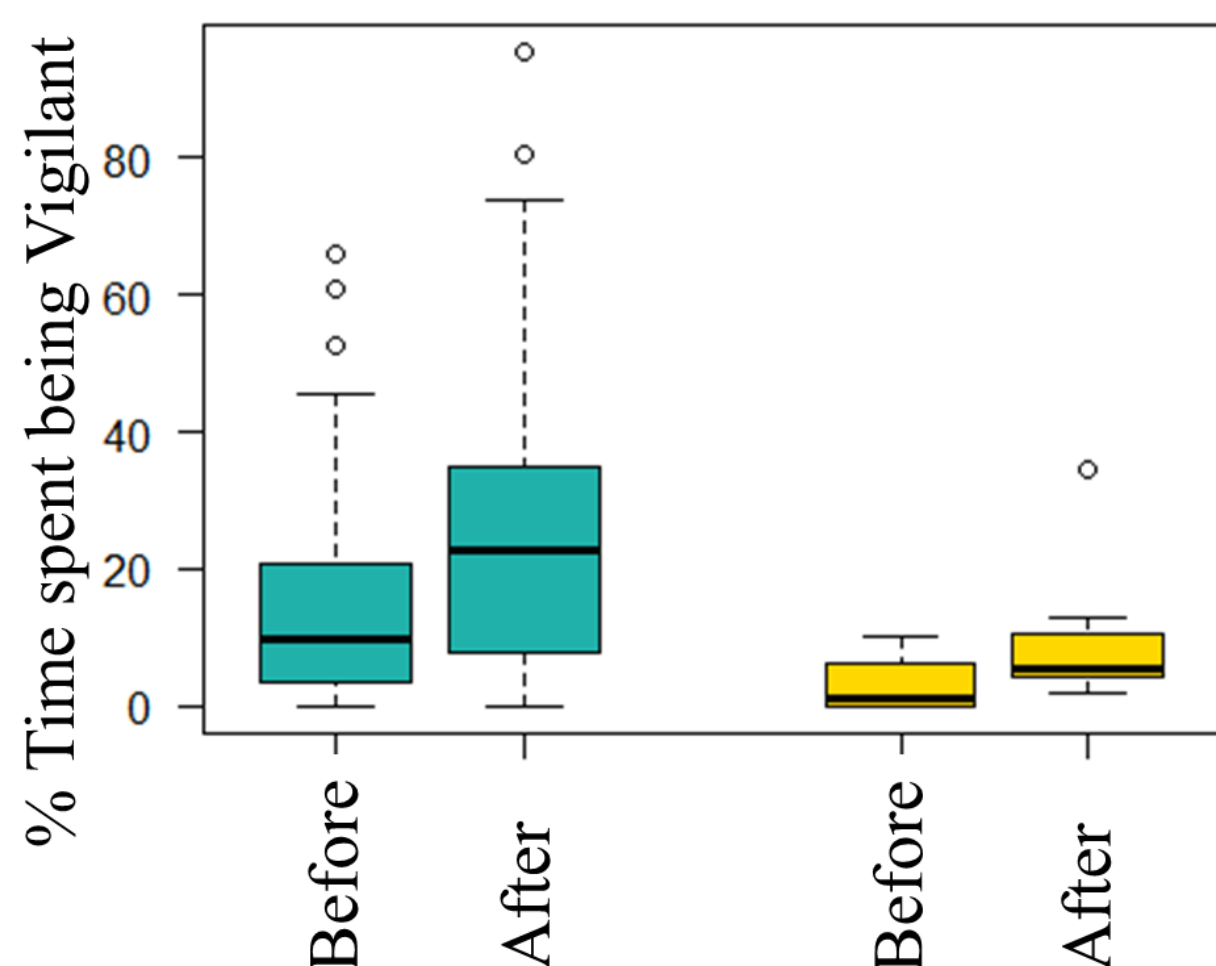
## Methods

**Five fear tests** were performed on 42 feral and 10 domestic White Leghorn chickens and **behaviour** of each individual was recorded through **continuous focal sampling** for 120 min. Additionally, **four-piece brain dissections** were conducted.

## Results

	Feral chickens	White Leghorn	
Initial Emergence latency (s)	331.03 ± 67	847.38 ± 26	*
Time spent in Central Zone of the pen (%)	13.01 ± 1.9	36.90 ± 5.2	***
Tonic Immobility Mean (s)	243.15 ± 18.2	286.27 ± 54	
Relative Brain Mass (%)	0.34 ± 0.014	0.18 ± 0.011	***
Relative Cerebrum Mass (%)	54.31 ± 0.43	56.81 ± 0.44	**
Relative Optic Tectum Mass (%)	11.74 ± 0.15	11.17 ± 0.15	*

Stars indicate statistically significant differences between Feral and White Leghorn chickens (Mann-Whitney U test: \*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001).



A significant increase in the % of time spent being Vigilant **after** the Predator Test compared to **before** was observed in the Feral chickens (blue: p = 0.0034) but not in White Leghorn (yellow: p = 0.058).

## Discussion

Some, but not all aspects of **fear** have increased in the feral chickens of Kauai, and **brain composition** has changed, suggesting that this population has undergone **adaptation** to the feral environment.

The results support the **complexity** of fear and **brain composition** as these feral chickens still differ from their wild ancestors.

Feralization appears to be more complex than the reverse of domestication, and is suggested to be **case specific**.

