

### DOMESTICATION

#### Traits enable domestication

*Nat. Ecol. Evol.* **2**, 1808–1817 (2018).

Domesticated plants and animals, as major sources of food, have been underpinning human civilization for more than 10,000 years. Recent genetic and archeological research has led to a better understanding of the domestication histories and mechanisms of such species. However, it remains elusive as to what biological traits determine the domesticability of plants and mammals farmed for food. By compiling and analysing two large datasets, Ruben Milla, at the Universidad Rey Juan Carlos, Spain, and colleagues now reveal the phylogenetic and phenotypic patterns of food domesticates of plants and mammals, thus advancing our knowledge of the potential of the species that provide human food.

The researchers first examined the distributions of food domesticates across mammalian and angiosperm families and genera. The relative abundance of food domesticates and the frequency of domestication events of the phylogenetic branches clearly showed non-random distributions, with an intense phylogenetic clustering for livestock and a moderate clustering for crop species.

To examine the phenotypic profiles of food domesticates, the data for three key traits of farm mammals and crop plants were compiled across a taxonomically and geographically broad sample of domesticated and wild species. Comparison of the phenotypic spaces suggests that the phenotypes of domesticated species rarely extend beyond the limits set by wild species, although ruminants represent an exception. Domesticated species share traits in common that distinguish them from wild species. Specifically, livestock animals generally have larger body masses and lower basal metabolic rates than wild mammals, indicating moderate to slow life histories. In addition, herbaceous crops tend to be larger in size, with larger seeds and higher leaf nitrogen content than their wild counterparts, which conferred competitive advantage in early agricultural habitats.

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Published online: 9 January 2019

<https://doi.org/10.1038/s41477-018-0355-y>