

ANALYSIS

# Valuing genetic resources in peasant economies: the case of ‘hairless’ creole pigs in Yucatan

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## Abstract

We report the results of a choice-experiment study to model preferences over a selection of breed traits of ‘creole’ pigs. The study was conducted amongst households of backyard producers and small farmers rearing this local breed in Yucatan, Mexico. Hypothetical choice data were collected to estimate the preference of households over alternative pigs profiles whose attributes distinguish creole pigs from the potentially more productive, yet less adapted exotic breeds currently threatening to severely displace this locally adapted animal genetic resource (AnGR). The observed choices are employed to estimate a series of random utility models whose results are first tested for preference equality between households and small farmers, then endogenous segmentation is allowed within households by means of latent class models. Stated-preference based estimates are found to be of the same magnitude as revealed-preference producers costs. As a consequence the method is deemed to be appropriate for the valuation of non-market functions in production. Estimates conditional on household characteristics are then presented and discussed.

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## 1. Introduction

Most of the benefits produced by local livestock in marginal production systems are captured by

producers, rather than consumers<sup>1</sup>. As a consequence the genetic resources of these breeds have mostly been shaped by producers’ preferences. It is, therefore, to the identification and characterisation of these preferences that research must turn

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<sup>1</sup> The term ‘local’ refers to livestock that have become adapted to the specific environments of low external input rearing systems. These livestock may be indigenous to the region, or more often those that were brought there many generations before—termed ‘criollo’ (creole) in Latin America.

to identify the implicit value of genetically determined traits as a first approximation to the valuation of local Animal Genetic Resources (AnGR). These breeds are often characterised by a bundle of genetically and phenotypically stable traits, which are often expressed in a complementary fashion. For example, foraging ability (selectivity of intake), tolerance of harsh ambient conditions, digestive capacity for fibrous diets, etc.

In marginal production systems the breeding pressure on livestock is directed to creating animals capable of performing satisfactorily on marginal resources. Livestock performance is valued by producers, but assessed mostly in non-market terms. It is, therefore, this category of economic agents and non-market functions that one needs to be able to study in order to derive economic values.

In this study, we use choice modelling to estimate producers' preferences for genetically determined pig attributes in the backyard economy of Yucatan. The empirical study allows us to derive economic estimates of each attribute and compare these with analogue production costs to assess how choice modelling performs in this task. We also characterise value attributes on the basis of household (HH) composition, showing how multi-attribute valuation can vary according to the HH socio-economic characteristics.

Backyard production systems play a major role in livelihood maintenance of subsistence economies (Anderson et al., 2002), particularly in marginalised rural systems. For example, the purpose of backyard livestock production for most peasant HHs is to smooth consumption patterns, provide a means of savings, insurance and cyclical buffering, as well as a crucial source of high quality protein food.

A species of special importance to subsistence farming in Latin America are pigs. Some well documented historical evidence supports the claim that the livelihood of many subsistence economies depends on backyard production systems, and in turn, a significant component of the latter depends on backyard pig production. Across Latin America this type of production has a long history, dating back to the Conquistadores who introduced the first population of pig livestock, from which

the local ('indigenous', or 'creole' or 'criollo') breeds have been developed, possibly with some inclusion from more prolific Chinese breeds<sup>2</sup>.

The genetic purity of these local pigs is now under serious threat by the indiscriminate adoption of exotic pig breeds. As a background to this study, and to provide the reader with some appreciation of the relevance of local pig breeds in these types of economies, we briefly present some issues resulting from the relatively recent eradication and repopulation of the creole pig in Haiti. This case is worth mentioning here as a negative example in a context, which is in many respects similar to the one under study.

In 1978 an eradication program destroyed the Haitian population of the creole Pig. This was deemed to be necessary (although contested by many observers) to protect the pork industry and subsistence economy of both Haiti and the rest of the region from African Swine Fever. The eradication affected 80% of the population of Haiti for whom pigs represented an important source of animal protein and food security as well as a means of wealth storage, thereby bringing widespread hardship to Haitians. The following excerpt from 'The Guardian' is descriptive:

'The creole pig was our whole life,' a Haitian man told us. 'It was the pig that birthed us, the pig that raised us, the pig that buried us.' Pigs were the island's honking bank accounts. Pigs paid to put kids through school (six out of ten of the island's children still cannot read), paid for your wedding, and paid for the scrap of land you wanted to buy. The Guardian, London, 24 October 1997.

Shortly after the eradication took place a repopulation program began. The process with which this was implemented—especially with respect to the compensation mechanism used—generated much controversy. However, the outcome of interest to this study is the replacement of the local creole pig herd population with a

<sup>2</sup> In the particular context of Yucatan the indigenous 'creole' breed is sometimes known as 'Box Keken'.

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