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Growth, blood, carcass and meat quality traits from local pig breeds and their crosses

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*Contrary to intensive pig production, local pig breeds and their production systems are able to respond to the high criteria and expectations of modern society in regard to some environmental aspects, animal welfare, food quality and healthiness. This study proposes the recovery, study and use of a cross between two local breeds, contributing to animal biodiversity conservation and to the income of local pig producers. This work studied the growth performance and blood, carcass and meat quality traits of Alentejano (**AL**), Bísaro (**BI**) and Ribatejano (**RI**) (AL × BI, BI × AL) castrated male pigs. Raised outdoors, pigs were fed commercial diets ad libitum and killed at ~65 kg (trial 1,* n = *10 from each genotype) and ~150 kg BW (trial 2,* n = *9 from each genotype). In trial 1, AL and AL × BI attained slaughter weight later than BI and BI × AL pigs, with AL presenting lower average daily gains than the other genotypes (*$P < 0.001$*). Alentejano and RI pigs presented higher (*$P < 0.01$*) levels of plasma total protein than BI. Overall, carcass traits were affected by genotype, with length (*$P < 0.01$*), yield (*$P = 0.07$*) and lean cut proportions (*$P < 0.01$*) lower in AL than BI, and intermediate values for crossed pigs. Conversely, AL pigs presented higher fat cut proportion (*$P < 0.01$*), average backfat thickness (*$P < 0.001$*) and 'zwei punkte' fat depth (*$P < 0.01$*) than BI and RI pigs. Alentejano pigs also presented higher Longissimus lumborum (**LL**) intramuscular fat (*$P < 0.05$*), myoglobin content and ultimate pH (*$P < 0.01$*), but lower total collagen (*$P < 0.05$*), drip (*$P < 0.001$*) and cooking losses (*$P < 0.01$*), and shear force (*$P < 0.001$*) than all other genotypes. Finally, LL showed a more intense red colour in AL than in BI pigs. In trial 2, AL pigs confirmed to be a slow-growing obese breed with lower bone and lean cut proportions than BI, and higher LL intramuscular fat, richer colour, lower water loss and higher tenderness. In both trials, RI pigs grew faster, with higher lean and lower fat cut proportions and backfat thickness, and with overall LL characteristics comparable to those observed in AL pigs. This work demonstrates some clear differences between AL and BI breeds while showing that their crosses present intermediate characteristics in most studied traits. These data on RI pigs can be useful to breeders' associations and farmers in order to consider the use of these crosses as an option or complement to pure line breeding.*

Keywords: swine, Alentejano, Bísaro, Ribatejano, meat physicochemical characteristics

Implications

Local pig breed production chains and the growing market of their (very) high-quality products agree more with current consumers' environmental, animal welfare, food quality and healthiness concerns than conventional production systems. This study proposes the recovery, study and use of a cross between two local pig breeds (Alentejano and Bísaro), the Ribatejano pig. This additional production alternative could help to maintain or increase the pure breed populations, through a sustainable production of less expensive, high-quality meat and meat products, which could potentially increase the profit of (small to medium-scale) pig producers.

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Introduction

Nowadays, consumers select meat and meat products not only according to the (accessible) price and perceived eating quality, but also by their nutritional value and healthiness, animal welfare issues and the ethics underlying the production of meat, as well as the level of environmental impact caused by the production system (Font-i-Furnols and