Innovative patties from Majorcan Black Pig meat: results of a consumer study in Barcelona

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The Majorcan Black Pig (MBP) is an untapped breed from Mallorca Island, in the Mediterranean Sea. The aim of the study was to innovate new, healthier products to expand demand and ensure the survival of MBP farms by identifying new market niches. To achieve this, bioactive compounds such as β-glucans and polyphenols were added to the patties, by including mushrooms (Boletus edulis) or blueberries (Vaccinium corymbosum), respectively in their composition. A study with 120 consumers was carried out in Barcelona. The consumers had to test five types of MBP patties, three innovative treatments and two controls: MBP patties (A), MBP with porcini mushrooms (B), MBP with blueberries (C); Pork and beef (D) and beef (E). The experimental design consisted of three tests: (1) Blind test: consumers tasted the five types of patties (overall liking on a scale from 1 (dislike extremely) to 9 (like extremely)). (2) Expected test: Consumers indicated general acceptance to the description of the five treatments, with the information about the origin of the meat, production system and potential beneficial effects of the added healthy ingredients. (3) Informed test: Consumers repeated the sensory test, but with the same information as the previous test in each tasting. There were no significant differences according to gender in the blind test. MBP patty treatment had a significantly higher sensory acceptance than the rest (in both the Blind and Informed test). In addition, the average score obtained by the MBP patty was significantly higher in the Blind and Informed tests – which include a sensory evaluation – implying that it was the preferred one by the consumers. The type of patties with vegetal ingredients were scored significantly lower than the other types of patties, and there was no significant effect of the information that had been given to consumers, indicating that consumers did not like so much the sensory characteristics of these patties (texture and flavor). There is a need to provide clear and understandable information to the consumers about the differential characteristics of the products, ensuring sensory quality. Funded by European Union’s H2020 RIA program (grant agreement no.634476).
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Conclusions

1. More information on production and the breeding environment of untapped breeds helps to improve the culture of traditional meat production, generating more accurate expectations, reducing uncertainty and connecting them with tangible characteristics of the product to consumers.
2. The meat industry needs to adapt to the new food tendencies demanded by states and consumers in the field of human health. Enriching meat with vegetable products can contribute to improve acceptance of meat products, as long as the information transmitted is honest and rigorous and if they like their sensory characteristics: flavor and texture.

Materials and Methods

A panel of 120 consumers representing the population of Barcelona has been selected to test the 3 innovative treatments: MBP patties (A), and adding: porcini mushrooms (B) and blueberries (C), with two control treatments: mixed pork and beef patties (D) and beef patties (E).

The experimental design consists of three tests:
1. Blind test: consumers taste all five treatments and score on an acceptability scale from 1 to 9 points.
2. Expected test: consumers receive a form with the information about the origin of the meat, production system and potential beneficial effects of the added healthy ingredients of the five treatments and score on the same scale of acceptability the expectations generated by the information.
3. Informed test: Consumers repeat the sensory test, now with information on treatments.

The aim of the study was to innovate in new healthier products to expand demand and ensure the survival of MBP farms by identifying new market niches.

Introduction

The Majorcan Black Pig (MBP) is a untapped breed from Mallorca island, in the Mediterranean sea. It is suitable for extensive production systems, due to its high degree of rusticity.

Two functional ingredients have been selected to enrich patties:
- Porcini (Boletus edulis): natural source of dietary fiber.
- Blueberries (Vaccinium corymbosum): natural source of antioxidants.

Results

The MBP patty treatment had a significantly higher sensory acceptance than the rest (high score in the phases where there is sensory evaluation).
- No significant effect on the acceptability of the products in relation to the information provided to the consumers in the treatments with a healthy ingredients (B and C) were detected.
- A clear and understandable information to the consumers about the differential characteristics of the product should be provided. To keep a high sensory quality in the new products is also crucial to maintain consumer’s acceptability.

Table 1. Information effect about the acceptability of different treatments of patties.

<table>
<thead>
<tr>
<th></th>
<th>Blind</th>
<th>Expected</th>
<th>Informed</th>
<th>Sig. phase</th>
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</thead>
<tbody>
<tr>
<td>MBP (A)</td>
<td>6.3</td>
<td>6.4</td>
<td>7.1</td>
<td>***</td>
</tr>
<tr>
<td>MBP porcini (B)</td>
<td>5.2</td>
<td>5.7</td>
<td>5.4</td>
<td>ns</td>
</tr>
<tr>
<td>MBP blueberries (C)</td>
<td>5.6</td>
<td>6.1</td>
<td>5.7</td>
<td>ns</td>
</tr>
<tr>
<td>Pork and beef (D)</td>
<td>6.0</td>
<td>6.1</td>
<td>6.4</td>
<td>*</td>
</tr>
<tr>
<td>Beef (E)</td>
<td>6.1</td>
<td>7.1</td>
<td>6.4</td>
<td>***</td>
</tr>
</tbody>
</table>

Sig. treatment: *** at 0.05; ** at 0.01; * at 0.001; ns: not significant.

Other Considerations

Where we can find significant differences were in the behavior of consumers by age groups. In the age ranges between 30 and 39 years, and between 40 and 49, there were significant differences between the three phases of the test. The information given to the consumers in this range of age, influenced significantly the sensory score in the informed phase of the test.

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