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应用复合盐保持风鸭风味降低钠盐用量

Application of composite salt keeps flavor of dry-cured duck and reduce additive amount of sodium salt

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英文关键词: [textures](#) [optimization](#) [salts](#) [potassium chloride](#) [calcium chloride](#) [calcium lactate](#) [sodium chloride](#) [dry-cured duck](#)

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中文摘要:

为探索氯化钾、氯化钙和乳酸钙替代氯化钠后对风鸭质构和感官品质的影响,在氯化钾、氯化钙和乳酸钙3个单因素试验的基础上,采用响应面分析法优化氯化钾、氯化钙和乳酸钙结合替代氯化钠的工艺参数,建立工艺参数与质构和感官品质的二元回归方程。结果表明:以氯化钾、氯化钙和乳酸钙为自变量,分别以咀嚼性和总体可接受度为响应值,得到的二元回归模型拟合度高($R_{12}=0.9572$; $R_{22}=0.9845$),氯化钙、乳酸钙和氯化钙与乳酸钙的交互作用对风鸭咀嚼性影响极显著($P<0.01$),氯化钾、氯化钙、乳酸钙和氯化钙与乳酸钙的交互作用对风鸭总体可接受度影响极显著($P<0.01$),氯化钾与乳酸钙的交互作用对风鸭总体可接受度影响显著($P<0.05$)。在氯化钠使用总量为250g的前提下,可利用的最大替代比为:氯化钾替代比为21.30%,氯化钙替代比为11.93%,乳酸钙替代比为11.12%。以此工艺生产的风鸭,在没有改变风鸭原有特性的基础上,氯化钠使用量下降了44.35%。研究结果为低盐肉制品的研究提供参考。

英文摘要:

Abstract: Currently, the consumption of cured meat products is not suitable for hypertensive consumers due to its high content of sodium, which significantly restricts the sales and progress of this kind of meat variety. Therefore, it is very necessary to develop a new mixed salt with low sodium that does not change the flavor of cured meat products. Actually, the partial replacement of sodium chloride by potassium chloride, calcium chloride, and calcium lactate has been proposed as a possible strategy to reduce the sodium content of meat products. This experiment was performed to study the effects of partial replacement of sodium chloride by using potassium chloride, calcium chloride, and calcium lactate on the textural properties and sensory quality of dry-cured duck. Based on the single factor tests for potassium chloride, calcium chloride, and calcium lactate, the Box-Behnken response surface methodology was applied to optimize the percentages of the replacement, and two quadratic polynomial mathematical models about textural properties and sensory quality were built. The results showed that, in the potassium chloride single factor experiment, with the substitution increasing, potassium chloride addition had a markedly negative effect on the taste ($P<0.05$), but had no significant effect on the texture of the products ($P>0.05$) and the highest substitution percentage was 25. In the calcium chloride single factor experiment, calcium chloride addition had a significant effect on the hardness and chewiness ($P<0.05$) but not the spring of products ($P>0.05$). While it had a significant effect on the sensory attributes of texture, aroma, taste, bitterness, and overall acceptability but not saltiness ($P<0.05$) and the highest substitution percentage of the calcium chloride was 10. In the single factor experiment of calcium lactate, it had a significant effect on the texture of hardness and chewiness and sensory evaluation of aroma, taste, saltiness, odor, and overall acceptability ($P<0.05$), but no significant effect on the spring or the texture ($P<0.05$). The substitution percentage of 15 of calcium lactate was the best suitable. The response surface model, with potassium chloride, calcium chloride, and calcium lactate as independent variables and textural properties and sensory quality as responses, was highly fitted ($R_{12}=0.9572$; $R_{22}=0.9845$). The textural properties of the dry-cured duck was significantly influenced by calcium chloride, calcium lactate, and calcium chloride \times calcium lactate ($P<0.01$). While the sensory quality of the dry-cured duck was significantly influenced by potassium chloride, calcium chloride, calcium lactate, calcium chloride \times calcium lactate ($P<0.01$), and calcium chloride \times calcium lactate ($P<0.05$). Thus, the maximum replacement percentages of the sodium chloride by potassium chloride, calcium chloride, and calcium lactate were 21.30%, 11.93% and 11.12%, respectively. Compared with the control group, the chewiness was almost not changed, and overall acceptability was decreased slightly (but in the acceptable range) in the verification test. The relative error of chewiness and overall acceptability compared with the predicted value were 2.07% and 11.12%, respectively. Under such conditions, the concentration of sodium chloride being added to the dry-cured duck was decreased by 44.45% without changing the major eating attributes of the products. The results provide reference for the development of low salt meat products.

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