

Effects of osmotic dehydration with ternary solutions on water loss and quality attributes of poultry meat

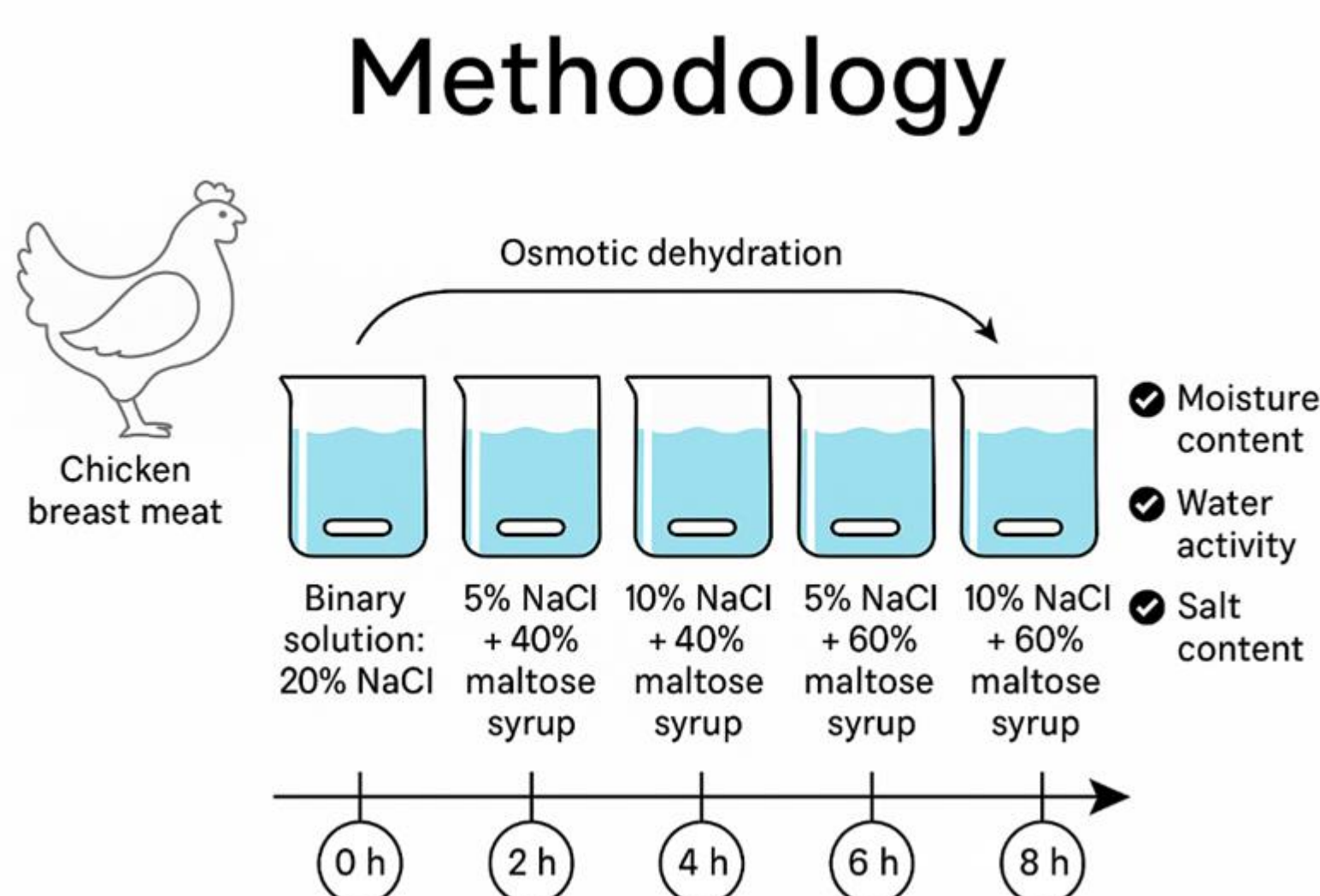
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INTRODUCTION & AIM

Osmotic dehydration is a mild, energy-efficient method for partial water removal, used to extend shelf life and preserve the quality of food. While traditionally performed with binary solutions (e.g., NaCl alone), recent studies suggest that ternary solutions—combining NaCl with maltose syrup—can improve mass transfer and product quality. However, this approach has not been extensively explored in poultry meat.

The aim of the study was to investigate the effect of osmotic dehydration using ternary solutions on selected quality attributes of poultry meat.

METHOD



RESULTS & DISCUSSION

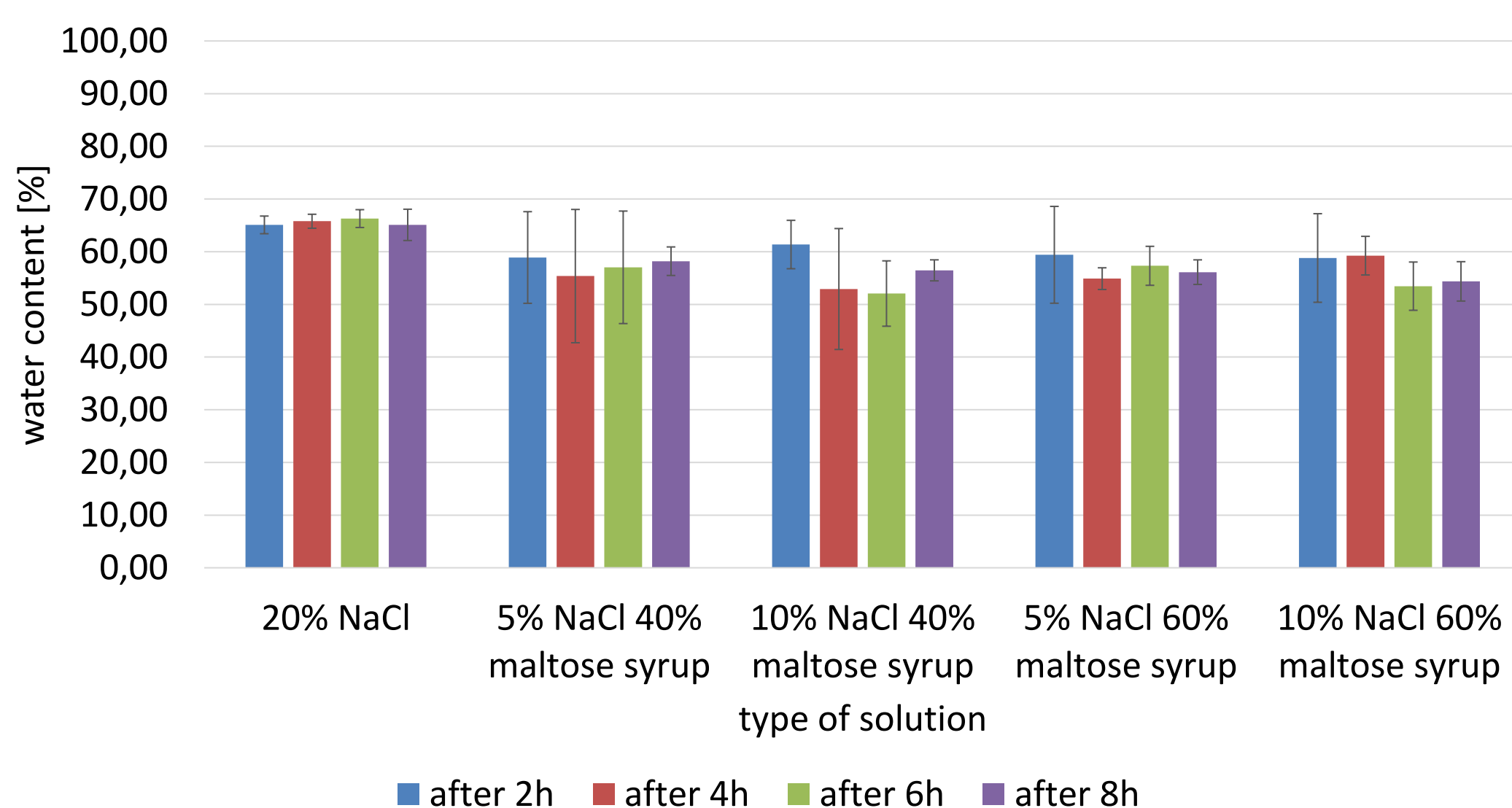


Fig. 1. Water content in poultry meat dehydrated in salt and maltose syrup solutions at different concentrations and times

Table 1. Water activity in poultry meat subjected to dehydration in salt and maltose syrup solutions of varying concentrations and durations.

	after 2h	after 4h	after 6h	after 8h
20% NaCl	0,920	0,887	0,871	0,870
5% NaCl 40% maltose syrup	0,957	0,948	0,941	0,939
10% NaCl 40% maltose syrup	0,954	0,937	0,926	0,920
5% NaCl 60% maltose syrup	0,966	0,952	0,944	0,940
10% NaCl 60% maltose syrup	0,959	0,944	0,932	0,925

Ternary solutions significantly enhanced dehydration efficiency. Water content dropped from **75.22% to as low as 54.37%**, with a concurrent decrease in water activity **from 0,971 to 0,920**, favoring microbial stability and extended shelf life. Notably, higher maltose concentrations led to better moisture removal and reduced NaCl uptake, preserving desirable quality traits.

These findings suggest that maltose syrup can act as an effective osmotic agent, improving dehydration selectivity

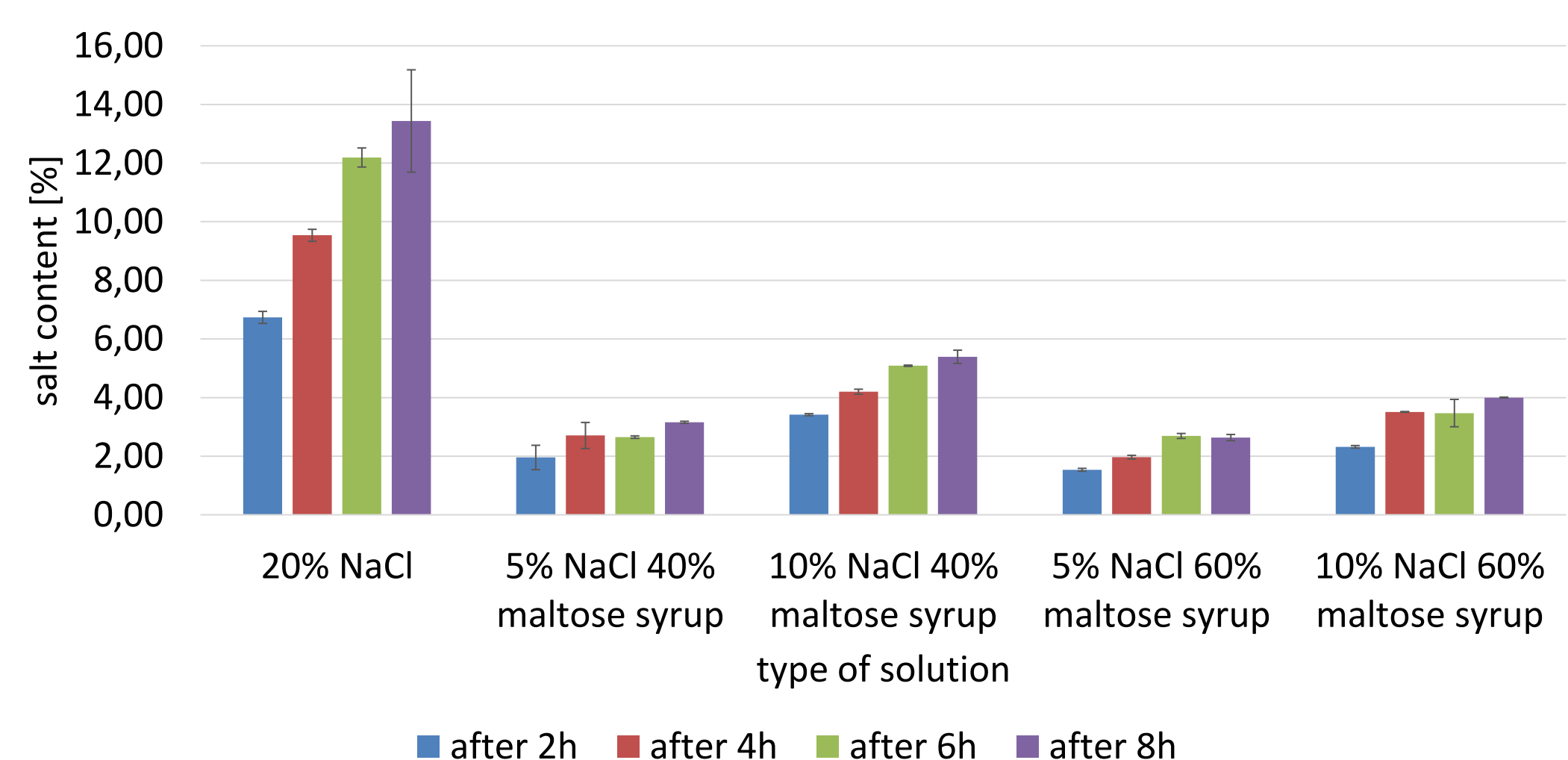


Fig. 2. Salt content in poultry meat dehydrated in salt and maltose syrup solutions at different concentrations and times

The use of ternary solutions resulted in a smaller increase in salt content in the dehydrated meat compared to the use of the two-component solution (20% NaCl). This may result from the high molecular weight of maltose syrup, as well as the relatively large size of its molecules, which may hinder their diffusion into the meat tissue.

CONCLUSION

The results indicate that the use of ternary solutions containing maltose syrup is beneficial from a technological point of view — it allows for a reduction in the salt content of the meat while maintaining dehydration efficiency, which may improve its sensory and health quality.

The best results, in terms of the conducted research, were obtained using ternary solutions with a 10% addition of NaCl.

The results highlight the potential of ternary osmotic solutions in poultry processing to achieve effective dehydration while limiting salt absorption, offering a balanced and efficient method for meat quality enhancement.