Food **Bulletin**

cafre
College of Agriculture
Food & Rural Enterprise

Issue 2

Healthy option chicken nuggets

Scientific evidence links excess salt levels with increasing blood pressure, which is a major risk factor in coronary heart disease and stroke. The Food Standards Agency (FSA) has identified processed foods as one of the main contributors of salt in the diet. Currently, adults are consuming on average 9g of salt per day. The Food Standards Agency (FSA) recommend a maximum salt level of 6g per day for adults and proportionately lower for children e.g. a daily maximum salt intake of 3g is recommended for children between 4-6 years. Currently, chicken nuggets purchased from supermarkets in Northern Ireland contain an average salt level of 1.2%.

The aim of this study was to develop organoleptically acceptable chicken nuggets with less salt and to assess the organoleptic effect of chicken nuggets containing salt replacement ingredients.

Trial 1: Decreasing the level of salt in chicken nugget meat

Analysis of a range of chicken nuggets currently available from supermarkets contains salt levels from 0.7-2%. Five chicken meat recipes were formulated with salt levels varying from 0.7% to 0.3% in 0.1 increments. Each recipe batch of chicken meat was enrobed using a plain predust and general purpose batter. The organoleptic properties were assessed using formal taste panels.

The results show a general trend of chicken nugget flavour gradually decreasing as the levels of salt decrease (Table 1). The recipe containing 0.5% salt in the chicken meat was used to assess three samples of batter mix with varying salt levels as this level was deemed acceptable by taste panel.

Table 1. Organoleptic acceptability of chicken nuggets with varying levels of salt

Sample (% salt)	Aroma	Texture	Flavour	Overall acceptability
0.7	6.55	6.00	6.73	6.64
0.6	6.73	5.00	6.18	6.27
0.5	6.91	6.18	6.55	6.64
0.4	5.91	5.82	5.36	5.45
0.3	6.55	6.18	5.45	5.82

Scores are reflected using the hedonic scaling range show scores of 5 and above are acceptable to consumers.

Trial 2: Decreasing the level of salt in chicken nugget batter

Approximately 35% of total chicken nugget weight is batter. The batter contains approx 1% salt which contributes to the overall salt level. This study compared a general purpose batter with a low salt batter and a tempura batter containing no salt. The results (Table 2) indicate that the level of salt in the batter mix had a considerable effect on the overall acceptability of the product.

Table 2. Organoleptic acceptability of chicken nuggets with different batters

Sample	Aroma	Texture	Flavour	Overall acceptability
High salt batter	6.00	5.50	6.00	6.08
Low salt batter	5.33	5.00	4.75	4.83
No salt batter	5.25	4.92	4.00	4.50

Scores are reflected using the hedonic scaling range show scores of 5 and above are acceptable to consumers

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Trial 3: Comparison of salt replacement ingredients in chicken nuggets

The organoleptic properties of chicken nuggets containing salt replacement ingredients (LoSalt, Icelandic Mineral Salt) were compared with reduced salt chicken nuggets. The results (Table 3) show chicken nuggets containing LoSalt to be the most acceptable in terms of aroma, texture, flavour and overall acceptability; however similar scores were achieved for the other samples.

The use of salt replacement ingredients appears to be an effective alternative to salt.

Table 3. Comparison of organoleptic qualities of chicken nuggets with sodium chloride and salt replacement products.

Sample	Aroma	Texture	Flavour	Overall acceptability
Table salt	6.71	6.00	6.50	6.43
Losalt	7.14	6.36	7.00	6.79
Icelandic salt	6.71	5.93	6.64	6.57

Scores are reflected using the hedonic scaling range show scores of 5 and above are acceptable to consumers

Definitions

High salt batter is a typical general purpose batter widely used within the food industry.
Low salt batter contains 75% less salt but still includes sodium based processing additives.
No salt batter contains flour, water and eggs with no salt added. The flour will contain sodium based processing additives.
LoSalt LoSalt contains a blend of sodium chloride (NaCl) and potassium chloride (KCl) as 66% KCl/33% NaCl.
Icelandic salt salt contains a blend of sodium (NaCl), potassium (KCl) and magnesium chloride (MgCl) as 40% NaCl/40% KCl/17% MgCl.

Conclusion

Organoleptically, a reduced salt chicken nugget product containing 0.6% salt levels can be achieved. This is a 50% reduction in the level of salt routinely found in retail chicken nuggets.

Further assistance in reducing the level of salt in your food products can be obtained by contacting Dr Roisin Lagan at CAFRE, Loughry Campus on 028 867 68153 or by emailing roisin.lagan@dardni.gov.uk

College of Agriculture, Food and Rural Enterprise (CAFRE) is an integral part of the Northern Ireland Department of Agriculture & Rural Development. Loughry is the College's centre of excellence for food technology and has lead responsibility for people development and technology transfer programmes in the food processing and supply industry. It provides key expertise in food manufacture, safety, packaging, innovation and waste minimisation.

If you have any comments or suggestions on future content, or need help with solving a problem in your business, please do not hesitate to contact Dennis Legge by emailing dennis.legge@dardni.gov.uk

This study is part of the Salt Reduction in Foods project currently being undertaken by CAFRE.

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