# UTILIZATION OF SOY OKARA IN PREPARATION OF NUTRACEUTICAL BUNS

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# Introduction

- Malawi and many other African countries depend on maize and other cereals for their staple food.

- Apart from maize, root tubers like potatoes and cassava are used in many other parts.

- These are basically starchy and do not provide nutritionally balanced meals though eaten in large quantities

- The majority of pple in rural areas are therefore at high risk in terms of protein energy malnutrition

# Introduction

- There is need therefore to include other food stuffs to ensure healthy meals.

- Soy bean is an alternative protein source for rural communities

- It is utilized in different forms

- Soy beans are highly digestible, high in unsaturated FAs & contain no cholesterol.

- Soybean & its products are relatively inexpensive protein source as compared to animal sources

# Introduction cont'

- A number of initiatives have been done by some NGOs, academic institutions, food industry companies and the govt to promote the use of soy.

- Soy okara is a by-product of soy milk processing that is often unutilized or underutilized.

- It is not only a rich source of dietary fibre, but also contain high quality protein.

- Buns and breads prepared from refined wheat flour are deficient in proteins, vitamins, minerals and fibre, & these need to be replaced.

# Aim

- To asses the potential of incorporating soy okara in bakery products to improve the nutritional quality.

**Specific objectives**

- Effects on sensory quality
- Effects on physical properties
- Effects on nutritional quality

# Materials & Methods

- Ingredients for preparation of buns were sourced from local market
- Buns were prepared using the standard recipe
- Preliminary studies were conducted based on the std recipe to establish %ge of okara supplementation thru sensory evaluation.
- Okara was incorporated at 5, 10 & 15%
- The sensory attributes were assessed by 15 semi-trained panel on 9-point hedonic scale.

# Materials & methods cont…

- Physical properties were measured by weighing & measuring scales
- Volume was measured using the mustard seed displacement method
- The proximate analysis was done using the std methods given by AOAC (1992)
- Moisture was analyzed using MBS4 Moisture Analyzer

# Results & discussion

## Sensory analysis

Table 1: **sensory attributes of okara buns (mean scores)**

| Bun Type | CC | CCA | A | TX | T | CE | OA |
|---|---|---|---|---|---|---|---|
| Control | 9.00 | 9.00 | 8.50 | 9.00 | 9.00 | 8.50 | 9.00 |
| 5% okara | 9.00 | 9.00 | 8.00 | 7.00 | 9.00 | 7.00 | 8.00 |
| 10% okara | 8.20 | 8.60 | 7.00 | 6.00 | 7.00 | 6.00 | 7.50 |
| 15% okara | 7.50 | 7.50 | 6.00 | 5.00 | 6.00 | 5.00 | 6.00 |
| SEM | 0.43 | 0.16 | 0.36 | 0.66 | 0.32 | 0.66 | 0.41 |
| CD at 5% | 1.94 | 0.70 | 1.61 | 2.98 | 1.45 | 2.98 | 1.84 |

# Results & discussion cont..

- Buns were accepted at 10% level of supplementation

- There was no significant effect on the sensory parameters (colour & appearance, aroma & taste) .

- The darker crust colour was due to increased maillard reaction btwn reducing sugars & proteins.

- Texture and elasticity mean scores were greatly reduced due to dough weakening caused by a decrease in gluten protein.

# Results & discussion cont...

- Physical characteristics

## Table 2: Physical characteristics of okara buns

| Bun Type | Vol (ml) | SV (ml/g) | Height (cm) | Area (cm sq) | Wt (g) | DRC (%) |
|---|---|---|---|---|---|---|
| Control | 121.67 | 2.08 | 4.70 | 35.00 | 58.88 | 320 |
| 5% okara | 92.33 | 1.54 | 3.90 | 35.20 | 51.09 | 460 |
| 10% okara | 71.67 | 1.43 | 3.70 | 36.68 | 51.67 | 375 |
| 15% okara | 30.00 | 0.60 | 3.07 | 35.68 | 51.88 | 200 |
| SEM | 5.27 | 0.09 | 0.21 | 1.04 | 1.40 | |
| CD at 5% | 23.71 | 0.39 | 0.97 | 0.97 | 6.31 | |

# Results & discussion cont..

- The physical properties were greatly reduced with increased addition of okara due to dilution of gluten network and increased fibre content.

- Buns accepted at 5% in terms of physical characteristics

- There was no consistent pattern in weight and area amongst the buns.

- Okara flour affected the dough extensibility properties, gas retention properties and bread quality

# Results & discussion cont..

- ## Proximate analysis

### Table 3: proximate analysis of okara buns (%)

| Bun Type | Carbs | Proteins | Fat | Ash | MC | Fibre | EV (Kcal) |
|---|---|---|---|---|---|---|---|
| Control | 62.39 | 2.04 | 3.87 | 1.39 | 30.28 | 0.03 | 292.55 |
| 5% okara | 62.07 | 2.34 | 5.76 | 1.46 | 26.07 | 1.61 | 308.88 |
| 10% okara | 59.91 | 5.91 | 6.82 | 1.91 | 22.05 | 3.65 | 314.24 |
| 15% okara | 58.38 | 6.79 | 8.80 | 2.13 | 19.08 | 4.82 | 339.88 |
| SEM | 2.11 | 0.46 | 0.39 | 0.02 | 0.57 | - | - |
| CD at 5% | 9.50 | 2.06 | 1.77 | 0.10 | 2.59 | - | - |

# Results & discussion cont..

- The results show improvement in proximate composition with the addition of soy okara.

- Proteins, fats, fibre and ash were increased. This is attributed to higher protein, fat, fibre and ash of soy beans.

- Carbohydrate and moisture contents were reduced.

- Energy was increased in okara buns due to increase in fat content

# Results & discussion cont..

## Nutraceutical content

- Incorporation of okara flour increased amount of isoflavones from 0 in control buns to 2.027mg at 15%.

- Isoflavones help in treating hypertension, high cholesterol, menopose symptoms, osteoporosis among other diseases.

# Conclusion

- Soy okara was successfully incorporated in buns
- There was significant improvement in nutritional and nutraceutical content on buns.
- The high nutritious buns can there4 be prepared by supplementing wheat flour with okara flour.
- This is of nutritional importance in developing countries where pple struggle to get proteineous foods.

# Recommendations

- There is need to create awareness on the incorporation of soy by-products to improve the nutritional & healthy status of pple.

- Domestic level processing and utilization of these by-products should be given a priority in rural areas.

# THANK YOU