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SUSTAINABLE HEALTHY DIET FROM INNOVATIVE TRANSFORMATION OF TRADITIONAL" FOOD "TIKHUR" (CURCUMA ANGUSTIFOLIA)

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Abstract

Tikhur/Arrowroot (**Curcuma angustifolia**) is a root vegetable. It's usually processed into a powder, also called arrowroot flour. The powder is extracted from the plant's rhizome, an underground stem with multiple roots that store its starch and energy. It is used as a gluten – free flour during fasting. Tikhur is a rich source of protein, Potassium, Iron B-vitamins and carbohydrates. It also boosts immunity. In order to improve its nutritive value, low cost Tikhur tikki was developed by adding Bajra, Moringa leaves and potato. Three different samples along with control samples were prepared and evaluated nutritionally and organoleptically. Nine point Hedonic Rating Scale was used for sensory evaluation while nutritive value was calculated using Food Composition Tables. The results revealed improvement in Proteins and other micronutrients.

Keywords: Protein quality, Sensory evaluation, Tikhur, Bajra, Innovative recipe, Value addition

Introduction

A healthy diet is one which promotes growth and development and prevents malnutrition. In the global nutrition policy sphere, the term malnutrition no longer refers only to under nutrition, such as wasting, stunting, underweight or deficiencies in vitamins or minerals. Malnutrition – in all its form – is now understood to include obesity as well as dietary factors that increase the risk of non- communicable diseases (NCDs) Such as heart disease, stroke, diabetes and certain cancer. NCDs are now a major cause of disability and death in all countries. Obesity and under nutrition may co-exist within communities and families. A high prevalence of under- nutrition is still a major public health problem in some low-income countries and may be seen in its more severe forms, whereas many middle-and –high – income countries are primarily concerned with NCDs, taking dietary adequacy for granted except among the most economically disadvantaged population.

Aims: Sustainable Healthy Diet from Innovative Transformation of Traditional" food "Tikhur,

Objectives

- To develop innovative transformation of tradition Food 'Tikhur'
- To evaluate newly developed products organoleptically.
- To calculate Nutritive value of the newly developed product 'Tikhur Tikki'.
- To evaluate the sensory of a newly developed product.

Methodology

The present work was carried out in the nutrition lab of Govt. D. B. Girls' P. G. College, Raipur (C.G.), the capital city of Chhattisgarh state, India. The whole experiment had one control and three experimental groups as T1, T2 and T3 with 40%, 30% and 20% value addition. The treatment combinations are given in Table No.1.

Table 01. Details of control and treatments without value addition

Ingredients	Control – T0	T1	T2	T3
Tikhur (gm)	100	100	100	100
Potato 2 medium(gm)	100	100	100	100
Bajra flour (gm)	-	5	10	15
Bengal dal (gm)	-	5	10	15
Moringa leaves (gm)	-	2	3	5
Ajwain (gm)	1	-	-	-
Chat masala	as per taste	as per taste	as per taste	as per taste
Salt	as per taste	as per taste	as per taste	as per taste
Oil	for shallow fry	for shallow fry	for shallow fry	for shallow fry

Calculation of nutritive 0000value: The nutritive value of control and treatment samples were calculated following using food composition tables of ICMR Nutritive value was calculated in terms of energy, protein, fiber, carbohydrate, Iron, Vitamin-B_{12}, potassium.

Table 01: Tikhur product with combine ingredients

Ingredients	Amount	Energy	Carbohydrate	Protein	Calcium	Iron	Potassium
Tikhur (gm)	100	334	83.1	0.2	10	1	20
Potato medium(gm)	100	60.95	12.9	1.35	8.53	-	473
Bajra flour (gm)	5	52.2	9.27	1.64	4.1	0.96	54.75
Moringa leaves	2	1.35	0.11	0.13	6.28	0.09	7.94
Bengal dal (gm)	5	32.91	4.67	2.16	4.63	0.61	95.7

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Total	210	481.41	110.05	5.48	33.54	2.66	651.39

Table shows total energy -481.41, carbohydrates -110.05, Protein-5.48, calcium-33.54, Iron-2.66 and potassium 651.39.

Table 02: Tikhur product with combine ingredients

Ingredients	Amount	Energy	Carbohydrate	Protein	Calcium	Iron	Potassium
Tikhur (gm)	100	334	83.1	0.2	10	1	20
Potato medium(gm)	100	60.95	12.9	1.35	8.53	-	473
Bajra flour (gm)	15	52.2	9.27	1.64	4.1	0.96	54.75
Moringa leaves (gm)	3	2.02	0.17	0.19	9.42	0.14	11.91
Bengal Gram	10	32.91	4.67	2.16	4.63	0.61	95.7
Total	228	482.08	110.11	5.54	36.68	2.26	655.36

Table shows that energy – 482.08, carbohydrate- 110.11, protein – 5.54, calcium – 36.68, Iron-2.26 and potassium- 655.36.

Table 03: Tikhur product with combine ingredients

Ingredients	Amount	Energy	Carbohydrate	Protein	Calcium	Iron	Potassium
Tikhur (gm)	100	334	83.1	0.2	10	1	20
Potato medium(gm)	100	60.95	12.9	1.35	8.53	-	473
Bajra flour (gm)	15	52.2	9.27	1.64	4.1	0.96	54.75
Bengal dal (gm)	10	32.91	4.67	2.16	4.63	0.61	95.7
Moringa leaves (gm)	5	3.37	0.28	0.32	15.7	0.23	19.85
Total	230	483.43	110.22	5.67	42.96	2.8	663.3

Table shows that Energy- 483.43, carbohydrate – 110.22, protein – 5.67, calcium -42.96, Iron – 2.8, Potassium- 663.3.

Material: For Tikhur Tikki

- Tikhur- 100gm
- Potato – 2 medium(weight 100gm)
- Bajra flour-15gm
- Bengal dal- 10gm
- Moringa leaves-5gm
- Ajwain – 1 gm
- Chat masala - as per taste
- Salt – as per taste

- Oil- for shallow fry

Procedure: For cooking Tikhur Tikki First boil the potatoes. Grind tikhur in a mixer to make powder. All the ingredients Ajwain, salt, chaat masala, moringa leaves, Bengal dal powder, Bajra flour mixed well. Then started making tikkis from the prepared mixture.

Duration of preparation: 15-20 min.

Material: For Chutney

- Tomato - 2 medium
- Green chilli – 3-4
- Mint leaf- 20gm

Procedure: For chutney First all of the wash ingredients. Grind it with the help of a grinder.

Organoleptic evaluation: sensory evaluation of samples for Tikhur was done by a panel of 3 judges. The Judges score the products with the help of Nine point Hedonic Rating Scale. Table-01, Table-02, Table-03

Result and discussion:

Nutritive value changes: Percentage changes in nutritive values of given three samples

Nutrients	Control T0	T1	T2	T3
Energy	-	481.41	482.08	483.43
Carbohydrate	-	110.05	110.11	110.22
Protein	-	5.48	5.54	5.67
Calcium	-	33.54	36.68	42.96
Iron	-	2.66	2.26	2.8
Potassium	-	567.6	567.6	663.3

Compression between T1, T2 and T3 shows that T1 has more energy than T2 and T3. T3 has more carbohydrates than T2, and T1.T3 has more protein than T2, T1. T3 has more calcium than T2, T1. T1 &T2 have the same Iron amount as T3T3 have more potassium than T2, T1. So Sample T3 has valued added nutritive value.

Physicochemical properties: Instant making food with deep brown and desirable aroma. The product formed a good source of protein, calcium, and fibers.

Sensory analysis: Sensory analysis indicated that the product having texture, appearance**,** colour, taste and last not the least flavor. Table shows that:

Sensory parameters	Control T0	T1	T2	T3
Appearance	-	18	23	24
Colour	-	26	21	27
Flavor	-	21	23	27

Taste	-	21	24	27
Texture	-	21	21	26
Overall acceptability	-	109	112	131

According to panel Sensory parameters, T3 is excellent in appearance, color, flavor, taste and texture. The rest of T2 has a good appearance, color, flavor, taste and texture and T1 has a fair appearance, color, flavor, taste and texture.

Conclusion: Tikhur Tikku is an instant made product. The product will be used as snacks. The product is useful for all age groups. Many of its health benefits are associated with its calcium and other nutrient content, which may stimulate the immune system.

of all individual and support functioning and physical, mental and social wellbeing at all life stages for present and future generation's contribute to preventing all forms of malnutrition (underweight, micronutrients deficiency, overweight and obesity);reduce the risk of diet – related NCDs; and support the preservation of biodiversity and planetary health. Sustainable healthy diets must combine all the dimensions of sustainability to avoid unintended consequences.

Sustainable healthy diets are dietary patterns that promote all dimensions of individuals' health and wellbeing; have low environmental pressure and impact; are accessible, affordable. The aims of sustainable healthy diets are to achieve optimal growth and development of all individual and support functioning and physical, mental and social wellbeing at all life stages for present and future generation's contribute to preventing all forms of malnutrition (underweight, micronutrients deficiency, overweight and obesity); reduce the risk of diet – related NCDs; and support the preservation of biodiversity and planetary health. Sustainable healthy diets must combine all the dimensions of sustainability to avoid unintended consequences.

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