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PHYSICOCHEMICAL AND MICROBIAL PROPERTIES OF TRADITIONAL IRANIAN STEW

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ABSTRACT

Different traditional stew is produced worldwide depending unpeopled palates and climatic condition. "Gheymeh Stew" is one of the most favorites Stew in Iran. The aim of this study was to investigate the microbial and physicochemical properties of this product that produced industrially. The results of this study showed that the technique has been used for the production of this product were perfect and all the measured properties was according to national standard.

Key word: Iranian Stew, Gheymeh Stew, Physicochemical, Microbial properties

INTRODUCTION

One of the human beings most sever problem during 21 century's industrial community is disease and sickness due to improper nutrition. lacked of sufficient time and routine life in a community which impeded human being from thinking about their health, finding ways for better living is the most priming art with has neglected by them and its wont be directed to the final destination expect by correct thoughts about appropriate nutrition [5]. Ready-to-eat meal includes food that is consumption without washing, peeling, cooking, mixing, or additional preparation. This kind of food immediate consumption after the sell and it could be cooked or raw, chilled or hot and don't need to further heat-treatment even re-heating [1]. Due to changing socio-economic of life style, number of working couples was increased and therefore ready to eat meal becoming popular because it saves labor and time. This kind of food market is developing

specifically in South Asian Countries, USA, Canada, UK and Gulf it means over 150 % per annum. In compare to usual food, this food has higher shelf-life. To days Peoples want value for money, time, in terms of variety and quality [2]. In industry after the preparation of raw material include washing, peeling, cutting, cocking or frying ingredient was mixed and fill in retort pouches. This pouch is a flexible packaging material that usually consists of different layers of packaging films like Polyster-Nylon-Aluminium-polypropylene or laminates that can withstand high pressure and temperature of process. One of the advantage of retort packaging refer to less chance to over heating during the sterilization thus products having better texture, color, flavor and less nutrients loss. The sterilization or retorting process ensures the stability of the foods in retort packaging, at ambient temperature on the shelf. The application of retorting process completely destroys all harmful microorganisms, and therefore making sure that the food has a suitable long shelf life and don't need to refrigeration [4]. When customer wants to eat, the pouch is put in boiling water or in microwave oven and after that serve to eat. In many countries, such ready to eat food produced for army and have been especially given to soldiers especially while located far away from their main department [6]. A stew defined as mixture of solid food ingredients that have been cooked in liquid. Ingredients in a stew was different and can include combination of vegetables (like as potatoes, carrots, tomatoes, beans, peppers and, etc.), meat, such as poultry, beef and lamb. Flavorings and seasoning include turmeric, saffron, mustard, red and black pepper and, etc may also be added. Stews have been made since ancient times. To get the foodstuff of different cultures, flavor, taste, aroma etc, it is important that product has suitable shelf life and so can be conveniently consumed. These foods are relatively new and came in store only a few years back and therefore study about its properties is interested. Therefore aim of this study was to investigation of physicochemical and microbial analysis of one popular Iranian stew "Gheymeh Stew". This product was prepped regarding to society needs and with industrial technology and inspiring Iranian traditional and domestic relish.

MATERIALS AND METHODS

Material

All of raw material was prepped from local store. Different ingredient that used for

preparation of Gheymeh Stew has shown in Table 1. Industrial progress of Gheymeh Stew preparation was shown in Figure1.

Methods

After processing sterilization stage by autoclave machine, final product is tested under chemical and microbial experiment. After passing quarantine period successfully and gaining required verification from laboratory sales and distribution license is issued for the product eventually. All the chemical analysis include percent of fat, protein, carbohydrate, salt, peroxide number was down according to international standard. Microbial tested include Aerobic Mesophilic Bacteria, Anaerobic Mesophilic Bacteria, Aerobic thermophilic Bacteria, Anaerobic thermophilc Bacteria was done according to international standard [3]. In order to provide proper conditions for microorganisms occurred in the canned food to grow, the samples were incubated at suitable temperature for sufficient time. After incubation, appearance and contents of the samples were examined. At least 3 samples at 35±1^{o}C for 10 days and at least 3 samples at 55±1 ^{o}C for 5-7days were incubated. After incubation when the samples reached ambient temperature, their appearance for leakage or swelling (soft, hard and springy) would be examined. Physical properties include cooked quality, external material; pure weight was done according to international standard [3]. PH was measured to wise, first after incubation in 55 ^{o}C and second after incubation in 30 ^{o}C.

RESULTS AND DISCUSSION

Table 2 shows physicochemical properties of the prepared gheymeh stew. As shown in the Table 2 the stew contains 18.3% carbohydrate. Carbohydrates are the most abundant organic compounds found in the nature. They tend to be the great part of energy derived from foods required by humans due to their abundance and low cost. The amount of energy produced by 1 g of digest able carbohydrate is 4.1 Kcal. The great part of carbohydrate contained in this food comes from potatoes, having 17% carbohydrate which are fried and then added to the stew. It should be noted that meat (contained about 0.5% carbohydrate) and split pea make an insignificant part of total carbohydrate in the stew.

Protein

Proteins are polymers made of amino acids which play important roles in developing required proper physical and textural properties of foods. They also have an enormous importance in developing desirable

aroma and taste of foods. Proteins, biologically provide components required for synthesizing ones, enzymes, and many hormones, all contributing to the life of living being. This stew provides approximately 8.6% protein mainly coming from meat. The used meat in this food contains about 17% protein. Potatoes containing about 2% protein provides a small part of protein in this stew.

Salt

Salt plays an important role in developing taste of foods. The used salt is as sodium chloride (NaCl). The contents of chlorine and sodium in the body tissues are 1.1 and 1.4 g/kg body weight, respectively. Sodium appears as extracellular adjusting osmotic pressure of extracellular fluids. On the contrary, chroline occurs in intracellular fluids, both provided by salt. The required daily amount of sodium by adults is about 1 g which is recommended as sodium chloride. Any excesses or insufficient intake may result in diseases such as hypo- or hypertension and / or cardiovascular ones. As indicated in Table 2, salt content of this stew is 0.7%. Given the allowed amount of sodium, 1.5%, determined by Iranian National standard the content of salt contained in this food is acceptable.

Fat

Fat content of this stew is 5% largely coming from the added oil in the formulation (Table1) and fried potato. A small part comes from the fat of meat because meat contains on average 20% fat affecting total fat of food. Fats are valuable sources of energy, producing energy 20 times that of carbohydrate and proteins. They also provide essential fatty acids, and vitamins including A, E, and K. Fat is the most important factor affecting the taste and flavor of food. This stew is oily regarding to Iranian palate. Iranian National standard determined the highest acceptable amount of fat as 7% for this stew. Given this fact, the fat content of this food is acceptable. Fats have direct effects on calorigensis. One gram of this stew produces 183.5 Kcal. Since this stew is consumed with rice, its calorigenesis needed to be addressed. As the standards determine that daily recommended amount of calorie are 2500 and 2000 for men and women respectively, those people who are on diet especially weight loss diet must consider this issue.

Peroxide

Peroxide is one of the primary products of oxidation which its occurrence in the food may reveal poor quality of oil or improper storage conditions. Iranian National standard specified that peroxide content in the sample should not exceed 5 mEq/kg [3]. The studied sample contains 2.8% peroxide which is below the specified amount. The sample thus is acceptable.

Physical properties

Inedible tissues of meat include connective tissue, fat, and burned meat and inedible vegetable tissues include split pea hull, potato peel, dried lime seeds and garlic hull. Iranian National standard determined the allowed amount of these two matters up to 5% [3]. As Table 2 indicates the amounts of inedible tissues of meat and vegetables are 5% and 0%, respectively.

Fullness means the ratio of package volume to the whole volume. The product fullness should not be less than 90% of content volume at ambient temperature. The sample fullness reported as 91.39% (Table 2) which is acceptable.

The quality of cooking is acceptable, namely all ingredients of the stew were neither crushed nor raw and hard. Weight percentage of meat split pea and potato means the ratio of meat split pea, and potato weight to their net weight in percent. As determined by Iranian National standard drain percentage of meat split pea and potato must be minimum, 14, 15 and 15% respectively. These amounts for the produced gheymeh stew are 14.9, 22.39, and 17.20%, respectively all meeting the standard. The measured pH value of the sample reported as 4.79 and 4.87 after incubation at 55°C and 35°C. It is evident that pH variations are insignificant suggesting no microbial growth.

Microbial

The results obtained from microbial tests are presented in Table 3. Microorganisms were examined at 10, 15, and 25 d following production according to National standard [3]. As indicated in Table 3, the bacteria did not show any growth suggesting the proper method of production, sufficient heating process and perfect sealing. As recommended by Iranian National standard, one gram of a food must be free from microorganisms, it may be said that the studied sample meets this standard.

CONCLUSION

All nations have developed their own traditional foods depending on their geographical situation and culture. Also many Iranian traditional foods such as gheymeh stew. The consumption of these

traditional foods has declined because of growing civilization resulting in increased consumption of fast foods. Since excessive consumption of fast foods may be harmful to health, their consumption needed to be reduced in all societies. Increasing production and marketing of traditional foods may be a promising method. However, more research is necessary.

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Table 1: Ingredient of Gheymeh Stew

Ingredient	Content (%)
lamb	14
pure weight	15
Fried potato	15
Vegetable oil	4
onion	4
Tomato paste	1.5
salt	1.2
Dried lemon	0.5
Lemon juice	0.5
Black pepper	0.05
turmeric	0.05
saffron	0.003
water	44.197

Table 2: physicochemical properties of Gheymeh Stew

Properties	Result	Acceptable limit*
cooked quality	Suitable	Suitable
external material	0 (%)	0 (%)
pure weight	293 (gr)	-
total	67.10	-
meat	14.86(%)	Minimum 14 (%)
pure weight	21.09(%)	Minimum 15 (%)
tomato	20.78(%)	Minimum 15(%)
meat	0.2(%)	Maximum 0.5 (%)
Vegetable	0(%)	Maximum 0.5 (%)
pory	92.64	Minimum 90(%)
pH (after incubation in 55^{o}c)	4.88	Minimum 4.6
pH (after incubation in 30^{o}c)	4.89	Minimum 4.6
Protein	8.6 %	-
Carbohydrate	8.6 %	-
Salt	<1 %	-
Fat	6.5 %	-

*: International standard

Table 3: Microbial properties of Gheymeh Stew

Bacteria	Result	Acceptable limit
incubation in 55°c	Suitable	Suitable
incubation in 30° c	Suitable	Suitable
Aerobic Mesophilic Bacteria	Negative	Negative
anaerobic Mesophilic Bacteria	Negative	Negative
aerobic Thermophilic Bacteria	Negative	Negative
anaerobic Thermophilc Bacteria	Negative	Negative

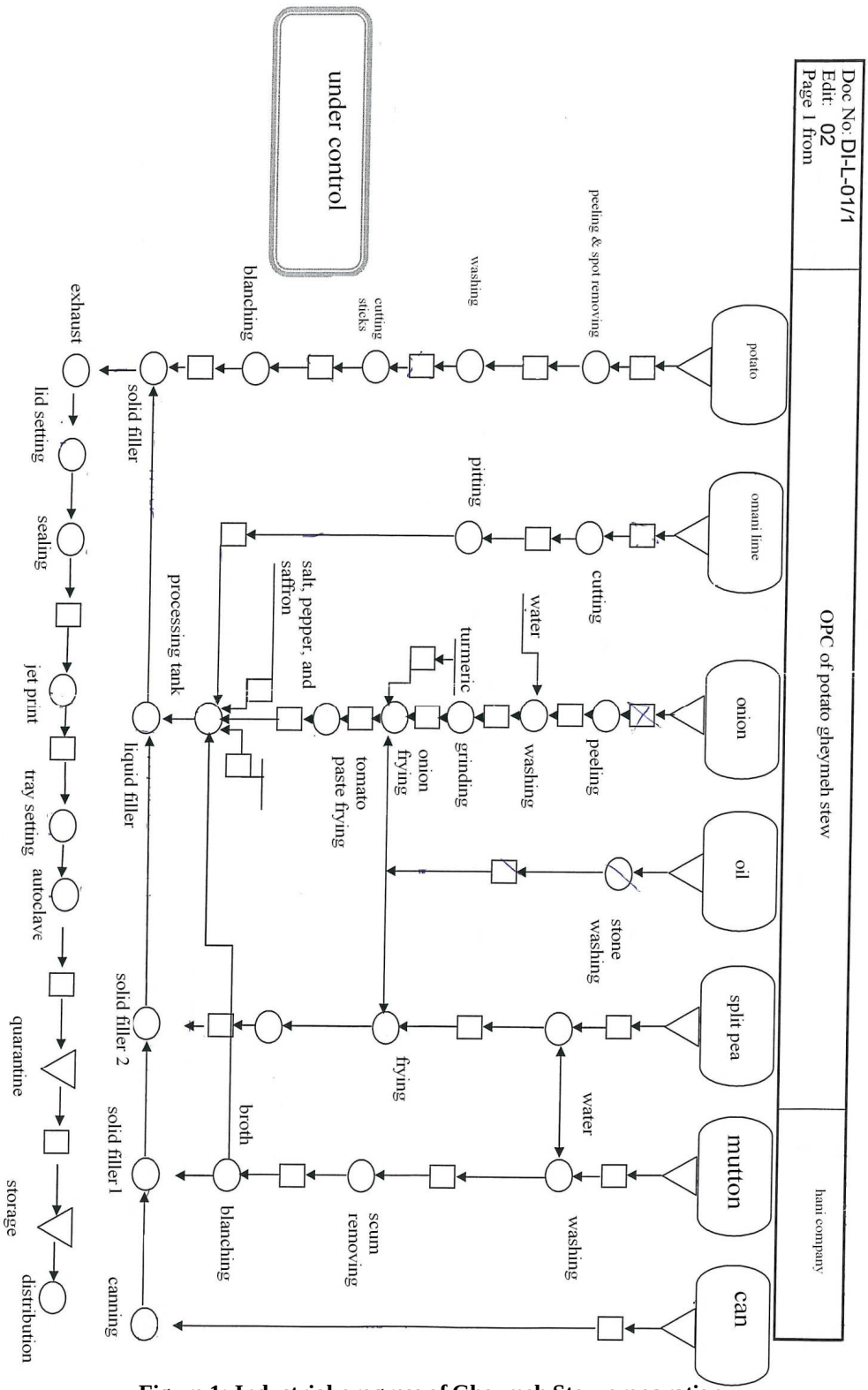

Figure 1: Industrial progress of Gheymeh Stew preparation