

Research

Comparative Analysis on Acceptability and Sale Share for Common and Newly Spicy Mish Produced from a Commercial Dairy Plant in Khartoum, Sudan

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ABSTRACT

Background

Mish is a concentrated traditional dairy fermented product that is currently manufactured by modern dairy industry in Sudan. It is a sour popular product.

Methods

This study was conducted with the objective of evaluating and comparing the sensory attributes of two types of mish using different types of spices. The common mish to which fenugreek and black cumin were added was compared with the newly spicy mish to which green fennel and black pepper were added. The experiment was performed at Best Dairy Plant where the tests were done on the first day of manufacturing and then weekly for 3 weeks for eight samples from four batches for both types of mish. In addition a questionnaire was conducted for obtaining data of the two types of mish by some selected customers. Also comparison between the two types of mish on production and sale ratio was estimated.

Results

Color, texture and the overall acceptability scores were reported high in common mish compared to that of the newly spicy mish, whereas the flavor showed a reversed trend, while the taste score was equal. Moreover the common mish revealed high production and sale ratio in comparison to the newly spicy mish.

Conclusion

It was concluded that awareness among the consumers about the medicinal values of these spices should be promoted for their use in different dairy products.

Keywords: Mish, Spices, Organoleptic attributes, Consumers, Production and sale ratio.

INTRODUCTION

Fermentation is generally considered as a safe and acceptable preservation technology of food and it is also recognized that fermentation of milk using LAB (lactic acid bacteria) will undoubtedly produce good quality products with highly appreciated organoleptic attributes.¹ The beneficial effects of fermented milk products are produced by a variety of bioactive compounds of LAB.²

Fermentation makes the food palatable by enhancing its aroma and flavor. These organoleptic properties make fermented food more popular than the unfermented one in terms of consumer acceptance.³ Fermented milk plays a crucial role in the nutrition of vulnerable groups of population such as infants, pregnant women, young children, and the elderly.⁴ When dealing with dairy foods, sensory quality is always involved on some level.⁵ The best raw ingredients make the best finished products so sensory quality is a critical aspect of dried dairy ingredients and fluid milk. Sensory perception is one of the keys to the

widespread flavorful and wholesome image that dairy foods continue to enjoy with the consumers.⁶

Mish is the semisolid fermented milk product manufactured in Sudan as well as in many countries.⁷ Mish is known by its high total solids content and acidification degree in addition to the added spices; black cumin, fenugreek and garlic.⁸ Mish has more shelf-life that could reach 21 days⁹ and up to 30 days in modern processing,⁸ which could be due to the added spices and controlling of processing conditions.¹⁰

Because the quality of mish in local market varies from producer to another, a practical approach towards improving the quality of mish was to evaluate mish produced commercially by the modern dairy industry.⁸ An increasing market concentration in food retailing has generated concerns about the market power of retailers towards consumers and input suppliers.¹¹ The four main methods of promotion within the mix are advertising, sales promotion, personal selling, and public relations and the most important factor in determining the optimal mix is identifying the target market.¹²

Recently, there is a growing interest to develop a variety of fermented milk products for health beneficial purposes.¹³ This study is designed to compare between two types of additives spices on mish organoleptic properties, consumers' acceptability and sale ratio of mish. The common mish flavored with black cumin, fenugreek and garlic was compared to the newly introduced mish flavored with fennel and black pepper.

MATERIALS AND METHODS

Source of Samples

Sixty-four commercially produced mish samples were obtained from retailers in Khartoum State during the period from September to December 2015. The samples represent two different type of mish (one is the common mish and the other is produced using newly introduced spices). Four batches of samples were obtained from Best Dairy plant; each batch contains 8 samples.

Manufacturing of Mish Samples

Mish was processed using starter culture consisted of *Streptococcus thermophilus* and *Lactobacillus delbrueckii sub sp. Bulgaricus* (YO- mix 505, Dansco, Denmark) at a rate of 1– 2%. Mish preparation steps were described previously.⁸ The spices that used for common mish (1% w/w salt, 0.05% w/w garlic, 0.5% w/w black cumin and 0.7% w/w fenugreek) were replaced by salt (1% w/w), garlic (0.05% w/w), green fennel (0.5% w/w)

and black pepper (0.15% w/w) for newly spicy mish.

Organoleptic Evaluation for the Two Types of Mish

The two types of mish were evaluated for the sensory attributes by 10 untrained panelists. They judged the color, taste, flavor, texture and overall acceptability. The evaluation was scored on 5 point hedonic scale (1 was unacceptable and 5 was acceptable) as was described previously.¹⁴

Questioner for Newly Spicy Mish

The newly spicy mish was evaluated according to Obi¹⁵ by questioner made for 20 semi trained people around production area in the factory. They evaluated color, taste, flavor, texture and overall acceptability. The evaluation was scored on 5 point hedonic scale (1 was unacceptable and 5 was acceptable) as was described by Ihekoronye and Ngoddy.¹⁴

Comparison between the Two Types of Mish on Production and Sale Rate

The two types of mish were compared on production rate from production records and sale rate from sales records during the period of September to December 2015 in the retails markets at Khartoum State.

Statistical Analysis

The data of the present study was analyzed statistically by SPSS for windows 10.0 package program. The results were expressed as a percentage basis.

RESULT AND DISCUSSION

Organoleptic Scores for the Two Types of Mish

As it showed in Table 1, the panel test for the two types of mish revealed that the color acceptability was 80% and 40% for common mish and newly spicy mish respectively. However the flavor acceptability was 26.3% and 68.4% for common mish and newly spicy mish respectively, according to the panelist. It was recommended that conditions of milk fermentation and preservation by spices should be evaluated in order to estimate the standards conditions for good quality dairy products.¹⁶ The present result supported Cruz who reported that the development of new food products and flavors with potential health benefits was found to increase the sales and consumers satisfaction.¹⁷

Taste acceptability was 50% and 50% for common mish and

Table 1. Comparison of organoleptic scores (%) between the common mish and the newly spicy mish

Sensory attributes Parameters	Acceptable		Moderately acceptable		Slightly acceptable		Moderately un acceptable		Unacceptable	
	Common mish	Spicy mish	Common mish	Spicy mish	Common mish	Spicy mish	Common mish	Spicy mish	Common mish	Spicy mish
Color	80	40	0	50	10	0	10	10	0	0
Flavor	26.3	68.4	57.9	15.8	5.3	10.5	10	0	0	5.3
Taste	50	50	30	0	10	10	0	0	10	10
Texture	80	70	0	0	0	20	20	0	10	10
Overall acceptability	70	40	10	50	10	10	10	0	0	0

newly spicy mish respectively, which showed no differences in taste between the common mish and newly spicy according to the panelist. In a different study, the taste was ranked equally for lactose hydrolyzed and control samples of frozen yoghurt.¹⁸ The salty taste is highly appreciated by many consumers in Sudan and saltiness is regarded as one of the basic flavors in food.¹⁹

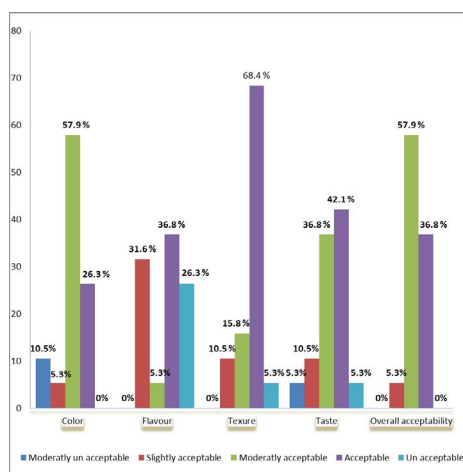
Texture acceptability was 80% and 70% for common mish and newly spicy mish, respectively. The texture result showed a slight difference between the two types of mish. This might be because fennel contains 6.3% moisture.²⁰ Moreover scientific findings have suggested that new dairy products that benefit human health (probiotic cultures, fortification with bioactive compounds) as well as improved sensory, especially textural characteristics. Thus, consumer demand for yoghurt and similar fermented dairy products has increased.²¹

The overall acceptability was 70% and 40% for common mish and the newly spicy mish, respectively. The results showed the superiority of the common mish in the overall acceptability compared to the newly spicy mish. It was concluded that the negative impacts on some of the quality attributes shall be addressed through product and process optimization.¹⁸ Because consumers play an important role as they must communicate or express their dissatisfaction or complaints before remedies can be taken.²² Advertising may add value to the purchase of expensive and risky products as it supports other promotional resources and can attract a large and geographically dispersed market.¹²

Questioner Scores for Newly Spicy Mish

The acceptability was 26.3%, 68.4%, 42.1%, 26.3%, and 36.8% for color, texture, taste, flavor and overall acceptability, respectively (Figure 1). Similarly Holzapfel reported that fermented foods are described as palatable and wholesome and are generally appreciated for attributes, their pleasant flavors, aromas, textures, and improved cooking and processing properties.²³ Moreover the unacceptable results were 5.3% for texture and 5.3% for taste (Figure 1). Texture unacceptability might be due to 6.3% moisture content of fennel seeds.²⁰ However for the taste, the unacceptability was due to panelist who is familiar only with the common mish.

Figure 1. The organoleptic scores of newly spicy mish among consumers



Many consumers didn't accept the spices used in newly spicy mish (Figure 1) because of colon problems with used spices as they stated; however they don't know the nutritive and medicinal values of the used spices. Medicinally, black pepper can be used for digestive disorders like large intestine toxins, different gastric problems, diarrhea and indigestion and also can be used against respiratory disorders including cold, fever and asthma.²⁴⁻²⁶ Fennel on the other hand, has antibacterial activity due to compounds such as linoleic acid, undecanal, 1,3-benzenediol, oleic acid and 2,4 undecadienal. Moreover the 5-hydroxy-furanocoumarin has important role as antibacterial activity of fennel plant.²⁷

Comparison between Two Types of Mish on Production and Marketing

Table 2 showed the comparison between the two types of mish share on production and sale. During the period from September to December 2015, the common mish obtained 88.2%, 86.9%, 85.7% and 88.9% and the newly spicy mish obtained 11.8%, 13.1%, 14.3% and 11.1% respectively, on production share. However the common mish obtained 87.9%, 86.2%, 84.9% and 88.4% and the newly spicy mish obtained 10.5%, 12.5%, 13.6% and 10.1% respectively, on sale share during the same period.

Table 2. Comparison between the sale of two types of mish on production and marketing during September to December 2015

Types of mish	Production ratio		Marketing ratio	
	Common mish	Spicy mish	Common mish	Spicy mish
September	88.2%	11.8%	87.9%	10.5%
October	86.9%	13.1%	86.2%	12.5%
November	85.7%	14.3%	84.9%	13.6%
December	88.9%	11.1%	88.4%	10.1%

The common mish showed higher production and sales share than the newly spicy mish (Table 2). These could be due to lack of consumers awareness about the values of the newly spices introduced, difficulty of changes towards introduced new products and lack of good planning, non-advertising and promotion for the new product before its introduction to the markets. This study supported Dommeyer and Gross who examined the role of customers' awareness and knowledge in the area of consumers' private information invasion by direct-marketers.²⁸ Consumer's awareness (either consciously or unconsciously) should precede the control, modification, elimination and change in human behaviors and decisions.²⁹ On the other hand, the level of market power that supermarket chains have to set retail prices beyond the competitive level is of particular interest.³⁰ Moreover the costs to reach one member of the target audience are lower as compared with personal sales.¹² Hence communication and promotion decisions are a critical element of retailer customer experience management strategy.³⁰

In order to increase the sale of the new product, this study recommends for the producing company to advertise, promote and to encourage consumers via additional incentives to increase their sale. The sales promotion to stimulate consumers to immediate purchase are price deals, coupons, samples, sweepstakes, contests, discounts, premiums, souvenirs, loyalty programs, samples, demonstrations and more.¹²

CONCLUSION

The panelist prefers the common mish more than newly spicy mish, this may be due to lack of consumers' awareness on the values of used spices. Hence more effort should be directed towards promotion of the new products before its introduction to the markets. Consumer awareness about the medicinal values of spices used on newly spicy mish should be promoted and encouraged.

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