

Flavor Profile of French Type Sald Dressings

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프렌치 타입 샐러드 드레싱의 향미 프로파일

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Abstract

Flavor profiles on regular and low-calorie French type salad dressings were carried out in the two different temperatures(5°C and 25°C). Data collected through consensus discussion. Panelists found less oil flavor and after-taste in the low-calorie dressing, which was to be expected, since water has been substituted for oil to reduce the calories. The two salad dressing had a moderate aroma and flavor of cider vinegar, with a slight taste of distilled vinegar. It was balanced by a tomato flavor consisting of tomato paste, tomato sauce, and tomato juice. There were slight aroma and flavor of spices, including onion and garlic, and a moderate amount of oil in the regular dressing. The overall sweet and sour flavor impression were in the low-moderate range, and were well balanced. The amplitude of the low calorie dressing was moderate, being slightly higher than that of the regular dressing. Temperature effects seemed to influence more one the low-calorie samples than regular samples.

요약

프렌치 타입의 저열량 샐러드 드레싱과 보통 샐러드 드레싱의 향미 프로파일을 두가지의 다른 온도(섭씨 5도 및 25도)에서 수행하였다. 냄새와 향미 프로파일에 대하여 각각 식초의; 사이다형 혹은 중류형, 토마토의; 패이스트형, 소오스형, 혹은 쥬스형, 향신료; 마늘의, 신선한 양파, 건조된 양파, 샐러리, 파프리카, 소금의, 기름짐, 전체적인 단맛, 전체적인 신맛 등의 특성이 개발되었다. 오일이 몰로 대치된 저열량 시료는 기대되었던 대로 레귤러시료보다 기름짐의 향미특성이 낮다고 평가되었다. 전체적인 조화도는 저열량 드레싱이 레귤러 드레싱보다 더 높았다. 저열량드레싱은 레귤러 드레싱보다 더 온도의 영향을 민감히 받는 것으로 나타났다.

I. Introduction

With increasing preferences in healthful foods among consumers, low calorie food diets seem to have more attentions than before. In response to those current requests, many food service centers come to use low calorie type salad dressings on their salad bars. Flavor profile of salad dressings could be used in the development of a diet dressing of the same type.

The flavor profile method provides a record of a product's aroma and flavor component similarities and differences which can be pinpointed by direct comparison of records¹⁾. Sensory analysis of both aroma by smelling and flavor by mouth results in a chronological tabulation of tastes, feeling ensations, and odors taken into the mouth and prepared for swallowing²⁾.

The objective of this study was to profile and compare the aroma and flavor of the regular French type

salad dressings with a low calorie dressing of the same type at room temperatures(25°C) and at refrigerated temperatures(4°C). Over-all impression of the aroma and flavor, as well as intensity and order of appearance of individual character or flavor notes are reported.

II. Materials and Methods

1. Panel training and ballot development

The panelists consisted of five female graduate students who majored in Food Science aging from 23 to 35 years old. All panelists had receive prior experiences in descriptive methods of sensory analysis through their courseworks. Specific training for flavor profiling before initiating the salad dressing study included the reading assignments on articles related to sensory flavor profile analysis(FPA) and formal lectures on the basic principles of sensory FPA.

All the panel members could communicate their flavor sensations verbally and used the same terms which presupposes common experience of expressing their sensations³⁾.

In the intensive orientation and training session, the panelists worked with an unstructured ballot to identify and list in order of apperance the perceptible flavor and aroma factors they found in the sample. Techniques were standardized to note the chronological order in which character notes appeared. In the followed discussion, techniques for examining the product were

suggested. Although the dressing is ordinarily recommended to serve at a refrigerated temperature, it was decided to examine the dressing at room temperature, since the warmer temperatures increased the intensity of the aroma and flavor, making identification of flavor factors more accurate. A list of perceptible factors was identified which became the major notes found on the ballot. The panel members came to a consensus agreement on the major factors after working with references and practicing several brands of the same type dressings. Available references were decided including;

SAMPLE _____ (aroma/ flavor)	DATE _____
	NAME _____
	0 1 2 3 4 5 6 7 8 9 10
Vinegar	
Cider	
Distilled	
Tomato	
Paste	
Sauce	
Juice	
Spices	
Garlic	
Onion, fried	
Onion, dried	
Celery	
Paprika	
Salt	
Oil	
Amplitude	
Overall Sweet	
Overall Sour	
Aftertaste	
*A ten point attribute scaling ballot. Intensities measured as follows: 0 = not perceptible, 1 = threshold, 2-4 = slight, 5-7 = moderate, 8-10 = strong.	

Fig. 1. Structured Scales* for French-type Salad Dressing Flavor Profile.

vinegar(cider and distilled) tomato paste, tomato sauce, tomato juice, garlic powder, fresh fried onion, dried onion powder, celery salts, paprika, soybean oil, and corn oil. The definitions of the references followed general concepts of the terms, except the notes of oil, which was defined as degree of mouth coating in the test. Panelists divided concepts between vinegar and sour impression by vinegar sour for the former and overall mixed sour impression for the latter. All references were examined at room temperature. A ten point attribute scaling ballot was used for the study, with intensities measured as follows⁴⁾: 0=not perceptible, 1=threshold, 2~4=slight, 5~7=moderate, 8~10=strong. The final developed ballot sheet is in Fig. 1.

2. Sample handling and testing procedures

Samples were purchased at local supermarket and kept at room temperature(25°C) and refrigerated(5°C) after opening. Half ounces of each samples were placed in one-ounce cups by the panel leader, covered with watch glasses, and kept at room temperature or chilled until used.

The complete profile from conceptualization to data summarization was conducted in sixteen 2-hour sessions. They included orientation (session 1), training (session 2~13), evaluation of test products (session

14~15), and data summarization and discussion of findings (session 16).

Testing was done in an environmentally controlled panel room. All glass and plasticware used in the study had been specially washed and rinsed, or purchased as odorless and flavorless. Because samples and references had strong lingering aftertastes, panelists took small bites of cracker or apple and rinsed with distilled deionized water between samples as necessary to avoid fatigue.

Formal profile sessions were consisted of a closed panel, followed by an open panel seated at the round table discussion room. Presented samples were randomized in the order. Considering that perception of flavor by foods display dynamic changes in intensity over time^{4,9)}, the panelists, working alone, removed the watch glass and allowed excess volatilized vinegar to escape. The intensity of overall sweetness and sourness were recorded, as well as amplitude. Finally, the flavor attributes and order of appearance were recorded. Aftertaste was also evaluated 10 seconds after swallowing.

III. Results and discussion

The data of sweet and spicy French-type salad dress-

Table 1. French type salad dressing flavor profile*

	Aroma				Flavor			
	regular		low calorie		regular		low calorie	
	5°C	25°C	5°C	25°C	5°C	25°C	5°C	25°C
Vinegar	4	4	3	4	3	4	7	6
Cider	3	4	1	5	4	5	3	3
Distilled	2	2	0	1	0	1	2	3
Tomato	4	4	2	5	4	4	4	5
Paste	3	3	2	5	3	3	3	4
Sauce	3	3	1	3	4	2	2	3
Juice	2	3	0	2	2	2	2	3
Spices	3	2	1	4	3	3	3	4
Garlic	2	2	1	2	3	3	2	3
Onion, fried	1	2	0	1	2	1	1	1
Onion, dried	1	2	0	2	2	2	2	2
Celery	0	1	0	1	1	1	1	1
Paprika	0	0	0	0	1	0	0	1
Salt	0	0	0	0	4	5	3	3
Oil	0	0	0	0	5	5	2	2
Amplitude	5	6	4	5	4	5	5	6
Overall sweet	5	3	2	4	4	5	5	6
Over sour	3	4	2	2	5	5	5	6
Aftertaste	0	0	0	0	5	3	5	4

*Intensities measured using a ten point attribute scaling ballot: 0=not perceptible, 1=threshold, 2~4=slight, 5~7=moderate, 8~10=strong.

Table 2. Order of appearance in French-type salad dressing flavor profile

	Aroma		Flavor	
	regular	low calorie	regular	low calorie
5°C	vinegar	tomato	oil	sour
	tomato	vinegar	vinegar	tomato
	spices	spices	sweet/tomato	spices
25°C	vinegar	tomato	vinegar	sour
	tomato	vinegar	sweet	tomato
	spices	spices	tomato/oil	sweet

sing flavor profile and its order of appearances were collected as shown in tables 1 and 2 respectively. In regular type dressing, the amplitude of aroma was judged as moderate, with the room-temperature dressing receiving a higher rating than the refrigerated sample. Vinegar was judged to have the same intensity at room temperature and refrigerated. This was low moderate, with cider vinegar predominating. Onion was a part of the aroma, but with low intensities. Overall sweet and overall sour aromas ranged from slight to moderate. The order of appearance of the aroma at both temperature was vinegar, tomato, and spices in regular sample.

The amplitude of flavor in regular dressing was slight, with low moderate overall sweet and sour intensities. The order of appearance of the flavor at low temperature was oil, vinegar, sweet, and tomato in regular sample, and sour tomato and spices in low calorie sample. The order of appearance of the flavor at room temperature was vinegar, sweet, tomato, and oil in regular sample, and sour, tomato, and sweet in low calorie sample. Garlic and dried onion flavor were slightly noted. Celery and paprika were at the threshold level. Oil flavor was moderate. Vinegar, oil and tomato were noted as aftertastes at both temperature in regular sample.

Panelists found less oil flavor and after-taste in the low-calorie dressing, which was to be expected, since water has been substituted for oil to reduce the calories. In low calorie dressing, the amplitude of aroma was moderate. Panel members found that it had a blended aroma, but not an intense aroma, particularly at refrigerated temperatures. A slight cider vinegar aroma

blended with a slight tomato paste and dried onion aroma gave a very low aroma profile at refrigerated temperatures. The aroma was somewhat more intense at room temperature.

The amplitude of flavor in low calorie dressing was moderate judged higher at room temperature than at refrigerated temperatures. The Chilled dressing was judged to have a moderate vinegar flavor, with some cider and some distilled vinegar notes. The tomato flavor was found to be slight to low moderate in low calorie sample. The spices identified included garlic and dried onion in small amounts and fried onion at threshold levels. Salt was judged slight, as was oil flavor. The aftertaste was slight to low moderate and was identified as sweet and vinegar.

The panel noticed the difference in the regular and the low calorie dressing in oil flavor, which may have been more of a mouthfeel factor. The low calorie dressing had a higher amplitude of flavor than the regular dressing. Profiling of the room temperature samples produced greater agreement between profiles than profiling of cold temperatures.

A texture profile of the salad dressing is recommended as an important step in the development of a low-calorie salad dressing for the future study. Consumers will expect a low-calorie dressing to have the same viscosity as the regular dressing. They will want it to coat the salad ingredients in the same way as regular dressing. Replacement of oil with water to reduce the calories and the consequent need for thickeners will change several of the textural characteristics.

References

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