



RESEARCH NOTE

Sensory Profile and Consumer Acceptability of Salted-and-Smoked/Dried Pork (*Etag*)-Based Seasoning Products

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Abstract

Etag, a traditional Philippine salted-and-dried pork delicacy, is central to the culinary heritage of the Cordillera region but remains restricted to local markets due to its traditional form. This study sought to modernize this indigenous product by developing and evaluating *etag*-based seasonings, specifically bouillon cube, granule, and liquid formats, bridging the gap between ethnic food preservation and the global convenience market. The current study profiled the sensory characteristics (color, flavor, texture, and clarity) of hot-smoked, cold-smoked, and sun-dried variants, and assessed consumer acceptability across local and non-local demographics. Sensory profiling by a semi-trained panel confirmed successful flavor replication: the cold-smoking process yielded the most intense smoke profile, while sun-dried variants retained a distinct, non-smoked cured pork flavor. Color profile showed high similarity to the original meat, ranging from butter yellow to amber, achieved without artificial additives. However, textural analysis revealed format-specific challenges; while cubes were fine-textured, granules exhibited clumpiness, and liquid seasoning lacked clarity ("muddy"). Consumer acceptability was measured using a 7-point Hedonic Scale. Results indicate significant geographic segmentation; hot-smoked and sun-dried variants demonstrated universal appeal, showing no significant difference in liking between consumer groups. Conversely, the cold-smoked variant emerged as a niche product, highly favored by local consumers but significantly less accepted by non-local consumers due to its intense smoke aroma and taste. Despite these regional differences, all variants achieved an overall acceptability mean above 4.5, indicating good commercial viability. The study concludes that *etag*-based seasonings are market-ready, provided that processing refinements address liquid clarity and granule flowability. Strategic geographic marketing is recommended to align the intense profiles of traditional variants with appropriate consumer segments.



Introduction

The culinary landscape of the Philippines, particularly in the northern regions, is marked by a deep appreciation for meat products, with pork holding a central place in communal and festive life. The people of the Cordillera Administrative Region (CAR), for example, traditionally feature pork prominently in clan reunions and ritualistic gatherings, where it is often paired with local rice wines and brewed beverages. Among the most distinguished ethnic delicacies served on these occasions is *etag*, often referred to as 'Igorot ham.' This traditional product is made from native pork cured in salt and partially preserved through the ancient methods of smoking or sun-drying. It is more than just a food; it is a cultural centerpiece that accompanies the region's vibrant displays of traditional costumes, dances, music, and crafts for both local and foreign visitors (Maddul et al., 2015). The curing and smoking process imbues *etag* with a distinct, intense umami flavor and remarkable shelf stability, making it a unique flavor carrier.

Recognizing the cultural and potential commercial value of this local delicacy, initial food science research has been directed toward standardizing the processing methods for both sun-dried and smoke-dried pork (*etag*). Studies by Maddul et al. (2015) focused on optimizing critical parameters such as curing duration, drying duration, and drying temperature. These standardization efforts were crucial. They not only added value and consistency to the local product but also ensured the production of safety-compliant dried pork, essential for expanding its acceptance beyond local markets. This foundational work successfully bridged the gap between traditional preservation and modern food safety, thereby setting the stage for exploring the ingredient's wider marketability and sophisticated applications. However, achieving safety and consistency is only the first step; the broader adoption of *etag* remains hindered by its traditional preparation requirements, which conflict with the efficiency demands of the modern culinary landscape.

In the modern culinary arts and commercial food industries, broth or stock is an indispensable base for developing high-quality sauces, gravies, stews, and braised dishes. However, preparing a

high-quality stock traditionally demands several hours of boiling and simmering, a process that is often impractical in fast-paced commercial kitchens and for everyday consumers. Similarly, utilizing traditional cured meats like *etag* in cooking often requires extended simmering to extract their full, complex flavor. This time-intensive requirement drives culinary practitioners and consumers toward convenient alternatives such as pre-made bouillon cubes, powders, granules, and liquid seasoning.

These convenience products are typically formulated as dehydrated bouillon using a blend of basic ingredients like salt, sugar, starch, vegetable fats, hydrolyzed proteins, herbs, and spices (Moretti et al., 2018). Liquid seasoning, while varied, generally contains flavor-enhancing compounds like sodium and fermented extracts (US2009098268A1), with related inventions utilizing ingredients such as salted rice malt (US2015289547A1) or sesame (JP2006230208A). Despite the widespread global market saturation of these convenience-type food products, a significant innovation and research gap persists in harnessing local, culturally meaningful ingredients from the Philippines.

Philippine salted dried meat (*etag*), with its naturally rich umami character and inherent shelf stability, represents an untapped, high-potential ingredient that is completely overlooked by today's convenience food industry. The near-total absence of research focused on incorporating *etag* into high-value convenience bases (bouillon cube, granules, and liquid seasoning) is a deep-seated missed opportunity, impacting both the preservation of a culinary heritage and the potential for local economic stimulus.

The present study is therefore critically important because it is the first to systematically explore and validate the commercial viability of this specialty ingredient as a food seasoning base. By introducing these novel *etag*-based seasoning products, the research aimed to fill a vital gap in food science literature through two main objectives: (1) describing the specific sensory profile (aroma, flavor, texture, and aftertaste) of the developed *etag*-based seasoning products; and (2) determining the acceptability of the developed products. These objectives are fundamental to establishing the study's practical impact and market readiness. Defining the sensory profile ensures that the product can be reliably reproduced, marketed, and improved, while assessing



acceptability provides the necessary data for quality control and preliminary market positioning.

This research will lay the foundational groundwork for developing high-value, market-ready Philippine food innovations. Ultimately, this initiative directly contributes to local food sustainability and offers a direct pathway for small-scale *etag* producers to participate in the lucrative convenience food market, thereby elevating a traditional product to a globally competitive, modern commodity.

Methodology

Sample Preparation

The preparation began with the production of *etag* using three distinct methods: cold-smoking, hot-smoking, and sun-drying. In preparing the cold-smoked pork, pieces were cured with salt for 120 hours and smoked for 56 hours using alnus trunks and leaves. The hot-smoked pork was cured for 144 hours and smoked for 16 hours using the same materials. Finally, the sun-dried pork was cured for 72 hours and dried in a solar drier for 56 hours (Maddul et al., 2015).

Once the smoked-dried and sun-dried pork (*etag*) were produced, these were further processed into convenience products such as bouillon cube, granule, and liquid seasoning. Smoke-dried and sun-dried bouillon cubes were produced through the process of dehydration and molding, utilizing a pressing machine. Dehydration, which reduces the moisture content of food, was combined with mechanically pressing the substance to form a cube. Smoke and sun-dried pork granules, on the other hand, were prepared through the process of grinding and dehydration. The liquid seasoning, both from smoke and sun-dried variants, water was added to *etag*, then finally reduced. The duration of dehydration and reduction were tested, and the most preferred treatments were subjected to further sensory qualities identification and acceptability testing.

Research Design

To evaluate the sensory qualities and consumer acceptability of the *etag*-based seasonings, a

Randomized Complete Block Design (RCBD) was employed. In this design, individual panelists served as blocks to minimize the influence of subjective variation in sensory perception. Each of the three *etag*-based variants (bouillon cube, granule, and liquid seasoning) was presented to every panelist in a randomized order to eliminate first-sample bias and carry-over effects. This approach ensured that differences in sensory scores could be confidently attributed to the product formulations rather than individual panelist preferences, providing a highly precise and unbiased assessment of the innovative products.

Sensory Evaluation

Panelist Selection

The study engaged two distinct panels to fulfill the research objectives, using specific inclusion criteria to ensure both technical accuracy and market relevance. For sensory profiling, a panel of fifteen (15) semi-trained evaluators was established. The selection was based on purposive recruitment of individuals with deep technical familiarity with traditional *etag* preservation. These evaluators consisted of local producers and habitual consumers within the CAR. This specific demographic was chosen to ensure a high degree of sensory acuity; their long-term exposure to traditional smoke and sun-dried pork allowed them to serve as a human "analytical instrument" capable of identifying subtle nuances in flavor, aroma, and texture.

Meanwhile, an untrained consumer acceptability panel to assess market readiness, composed of a larger cohort of 54 untrained panelists, was recruited through purposive sampling. Recognizing that geographic origin significantly influences flavor perception, this panel was strategically stratified into two subgroups: (1) Local Consumers (CAR Residents) represented the "traditional market," individuals accustomed to the unique sensory profile of indigenous preserved meats. Their feedback served as the benchmark for product authenticity. (2) Non-Local Consumers (Visitors/Tourists) consisted of individuals from various regions outside of CAR. Their inclusion was critical for evaluating the study's objective regarding geographic market segmentation and the potential for *etag*-based products to appeal to wider, non-traditional market segments.



All participants were pre-screened for their willingness to participate and had no known allergies to pork or smoke-derived products. By involving both traditional "gatekeepers" (locals) and potential new "adopters" (non-locals), the study ensured a robust evaluation of both product quality and commercial viability.

Sample Evaluation

Sensory evaluation was conducted in two phases. In the first phase, a semi-trained panel performed descriptive sensory profiling to identify the key attributes of the etag-based bouillon cube, granule, and liquid seasoning. In the second phase, untrained panelists assessed the products' color, aroma, taste, and overall acceptability.

All samples were labeled with three-digit random codes to prevent identification bias. Preparation methods varied by product format: the bouillon cube was reconstituted in warm distilled water (60°C) for flavor and aroma assessment, while color and texture were evaluated in their solid state. Conversely, granule and liquid seasoning were presented in their raw form. For the profiling phase, a consensus-based approach was used to finalize the attribute list. For the consumer phase, sample presentation was randomized to mitigate order and carryover effects. Data collection was facilitated using three instruments: (1) sensory acuity scoresheets for panel screening; (2) descriptive profiling and intensity rating forms; and (3) 7-point hedonic scale scoresheets (1=Dislike Extremely; 7=Like Extremely).

Data Analysis

Thematic analysis was employed to delineate the quality attributes of convenience-type products developed based on the input of semi-trained panelists. ANOVA ($p < 0.05$) was utilized to compare significant differences among the convenience-type products with respect to their variants, while Fisher's LSD was applied to determine sample differences. T-test ($p < 0.05$) was used to ascertain significant differences in the convenience-type products based on panelist type.

Declaration of AI Use and AI Tools Used

The authors used AI-assisted tools, namely Grammarly, ChatGPT, and Gemini, solely to

improve the clarity, readability, and grammatical accuracy of the manuscript. These tools were utilized for language refinement and editing purposes only. All scientific content, data analysis, interpretations, and conclusions, and the final version of the manuscript were developed, reviewed, and approved by the authors, who assume responsibility for the accuracy and integrity of the work.

Results and Discussion

Sensory Profiles of Etag-Based Seasoning Products

A semi-trained panel was utilized to characterize the sensory attributes of the etag-based bouillon cube, granule, and liquid seasoning. This profiling focused on establishing the unique flavor and aroma markers derived from *etag*, with the resulting descriptors summarized in Table 1.

Color

The color of the developed products consistently reflects the appearance of the original *etag* variant used. This is expected as no additional artificial colorings or flavorings were incorporated into the formulations. The sun-dried bouillon cube and granule samples exhibited a butter yellow color, aligning closely with the description of solar-dried pork, which Maddul et al. (2015) reported as taking on an amber shade after 56 hours of solar drying. Similarly, the color of the smoked products (hot-and cold-smoked cube and granules) mirrored the derivative meat. Maddul et al. (2015) noted that hot-smoked *etag* has a lighter brown shade than cold-smoked due to the difference in smoke intensity and exposure. The instrumental color analysis findings by Garambas et al. (2022) described the hue coordinates of traditional smoked Ibaloy meat as falling between red and yellow 58°58" and 58°28" for 24-h and 36-h smoke durations, respectively. The color of the developed cube and granule aligns with this reddish-brown/yellowish-brown hue.

For the liquid seasoning, the final color remained within the yellow-to-amber range across all variants but varied in intensity. The hot-smoked liquid seasoning was the darkest (amber), which could be attributed to the chemical



Table 1*Sensory Profile of Convenience-Type Products*

Variants	Characteristics		
	Color	Texture/ Clarity	Flavor
<i>Bouillon Cube</i>			
Hot-smoked	Light Brown	Fine Textured	Distinct smoke Flavor
Cold-smoked	Brown	Fine Textured	Very distinct smoke flavor
Sun-dried	Butter yellow	Fine Textured	Distinct " <i>etag</i> " flavor
<i>Granule</i>			
Hot-smoked	Yellowish brown	Clumpy	Moderate smoke flavor
Cold-smoked	Brown	Clumpy	Distinct smoke flavor
Sun-dried	Butter yellow	Clumpy	Moderate " <i>etag</i> " flavor
<i>Liquid Seasoning</i>			
Hot-smoked	Amber	Muddy	Distinct smoke flavor
Cold-smoked	Dark yellow	Muddy	Distinct smoke flavor
Sun-dried	Light yellow	Muddy	Distinct " <i>etag</i> " flavor

changes and potential browning reactions occurring during the high-temperature hot-smoking process and subsequent processing, leading to greater pigment extraction.

In essence, the color of the *etag*-based seasoning products, regardless of variants, closely matches that of the original *etag*, with the intensity varying directly based on the initial drying and smoking method employed.

Texture (For Bouillon Cube and Granules)

The textural properties were primarily dictated by the final product format. Regardless of the *etag* variant, the cube was consistently described as fine-textured by the panelists. This is a direct consequence of the industrial refining and molding process used for bouillon cube, which standardizes particle size and density. On the other hand, the granules were described as clumpy. This characteristic is due to the agglomeration of small particles, a common phenomenon in powder and granule food products (Moiche et al., 2002). The clumping is likely a result of the grinding process (3mm grind size) combined with the inherent moisture, fat, or protein content of the *etag* derivative products. While Suman and Sharma (2003) noted the positive impact of a 3-mm grind size on meat patty sensory scores, the resulting clumpiness in

a dry seasoning granule may negatively affect flowability and dissolution. Therefore, ensuring uniform granule sizes and incorporating anti-caking agents are key considerations for refinement.

Clarity (For Liquid Seasoning)

Both smoke-dried and sun-dried liquid seasoning were described as muddy (or cloudy). This lack of clarity suggests poor filtration or the incomplete removal of lipid or insoluble protein fractions, such as the fat component included during processing. As Dodgshun and Michel (2008) indicated, insufficient skimming or improper filtration leads to cloudiness.

Flavor

The flavor profile was the most differentiated attribute, directly reflecting the original *etag* processing method. The cold-smoked *etag*-based seasoning products consistently exhibited a "Very distinct smoke flavor" (cube) or "Distinct smoke flavor" (granules/liquid). This is consistent with the process, where cold-smoking involves longer exposure (56 hours) at a low temperature (26°C to 43°C) compared to hot-smoking (16 hours at 71°C to 79°C) (Maddul et al., 2015). Marianski (2007) affirmed that more intense and longer smoke application leads to a more distinct smoke flavor



due to deeper penetration of volatile smoke compounds into the meat matrix. On the other hand, hot-smoked *etag*-based seasoning products showed a "Distinct smoke flavor" (cube/liquid) or "Moderate smoke flavor" (granules), indicating a noticeable but less intense smokiness than the cold-smoked variants, aligning with the shorter, higher-temperature smoking process. While the sun-dried *etag*-based seasoning products were characterized by a "Distinct '*etag*' flavor" and a "Moderate '*etag*' flavor." The ability of the panelists to clearly identify the characteristic *etag* flavor, even after extensive processing, confirms that the essential flavor compounds were retained and were not masked by other flavorings or seasonings.

Consumer Acceptability of *Etag* Granules, Bouillon Cube, and Liquid Seasoning

The developed *etag*-based seasoning products, bouillon cube, granules, and liquid seasoning, represent an effort to bridge traditional preserved food with modern market demands, potentially for wider geographic market segments. All products are derived from three distinct *etag* variants: hot-smoked, cold-smoked, and sun-dried. The consumer acceptability was assessed across two major factors: (1) the type of consumers (local

vs. non-local) and (2) the *etag* variant used. Acceptability was measured across color, aroma, texture (clarity for liquid), taste, and overall acceptability using a 7-point Hedonic Scale.

Etag-Based Granule

For the general acceptance (overall acceptability), the t-test results (Table 2) indicate that both hot-smoked *etag* granule and sun-dried *etag* granule were universally accepted by both local and non-local consumers across all attributes (color, aroma, texture, taste, and overall acceptability). The non-significant t-computed values ($t_{\text{comp}} < t_{\text{crit}}$) suggest that these two variants are desirable for a wider geographic market segment, as they do not show significant preference differences based on consumer origin. Table 2 likewise shows that the cold-smoked *etag* granule showed a significant difference ($t_{\text{comp}}=2.24 > t_{\text{crit}}=1.98$) between consumer groups only in terms of taste. Contrary to expectations of local preference, local panelists, who possess a deep-seated familiarity with the traditional flavor profile of *etag*, gave a lower acceptability rating (4.52) for the taste compared to non-local panelists (5.18).

Table 2

General Acceptance of the Convenience-Type Products

Evaluator	Color	Aroma	Texture	Taste	Overall Acceptability
Hot-smoked <i>etag</i> granule					
Local Consumers	4.96	4.88	5.02	5.14	5.16
Non-local Consumer	5.34	4.94	5.32	5.22	5.42
<i>t-com</i>	1.80	0.22	1.42	0.31	1.20
<i>t-crit value</i>	1.98	1.98	1.98	1.98	1.98
Cold -smoked <i>etag</i> granule					
Local Consumers	5.14	4.96	5.04	4.52	4.92
Non-Local Consumer	5.16	5.06	5.06	5.18	5.18
<i>t-com</i>	0.08	0.38	0.08	2.24*	1.12
<i>t-crit value</i>	1.98	1.98	1.99	1.98	1.99
Sun-dried <i>etag</i> granule					
Local Consumers	5.54	5.02	5.28	4.86	5.06
Non-local Consumer	5.08	4.76	5.04	4.8	5.12
<i>t-com</i>	1.95	1.01	1.10	0.22	0.25
<i>t-crit value</i>	1.98	1.98	1.98	1.98	1.98

*-significant at 0.05 level of confidence

(7-point Hedonic Scale; 1=Dislike extremely, 4=Neither like nor dislike, 7=Like extremely)



This finding aligns with the nuances of geographic product origin and flavor familiarity discussed by Verlegh and Ittersum (2001). In this case, the locals' lower rating suggests a 'critically informed' evaluation; the cold-smoked granule may have failed to meet the specific sensory standards or authentic intensity expected by those accustomed to the traditional product. While non-local consumers found the taste relatively more acceptable (likely due to a lack of traditional benchmark), the lower local rating indicates that the cold-smoked formulation may require refinement to better capture the authentic flavor profile valued by traditional consumers.

Etag-Based Bouillon Cube

The hot-smoked *etags* cube general acceptability (over-all acceptability) showed no significant differences in acceptability between local and non-local consumers for any attribute (Table 3), indicating wide appeal, similar to the corresponding granule variant. Specifically, cold-smoked cube revealed significant differences ($t_{comp} > t_{crit}$) between consumer types in two key areas: Aroma ($t_{comp}=3.42$) and Taste ($t_{comp}=2.02$). In both cases, local consumers exhibited significantly

higher acceptability ratings (Aroma: 5.24; Taste: 4.96) than non-local consumers (Aroma: 4.38; Taste: 4.48). This further reinforces the finding from the granules: the intense smoke components inherent in the cold-smoked *etags* are polarizing, being strongly favored by local, familiar consumers but disliked by non-local consumers. The intense smoke flavor and aroma could be attributed to higher concentrations of phenolic compounds and other volatile organic compounds characteristic of cold-smoking, which may be perceived as too strong or "chemical-like" by non-local consumers (Marianski, 2007).

For the sun-dried *etags* variant, the sun-dried cube showed a significant difference only in Texture ($t_{comp}=3.42$). Local consumers rated the texture significantly higher (5.24) than non-local consumers (4.38). This difference in texture acceptability is intriguing and may be linked to consumer expectations of cube dissolution or mouthfeel, perhaps related to the specific grind or fat content derived from the sun-dried *etags*.

To sum up, findings show that the hot-smoked cube has the broadest market potential. The cold-smoked cube is clearly a niche product for local

Table 3

Comparison of Consumer Acceptability of Etag Cube

Evaluator	Color	Aroma	Texture	Taste	Overall Acceptability
Hot-smoked <i>etags</i> cube					
Local Consumers	4.8	5.04	4.86	4.84	5.02
Non-local Consumer	5.24	5.20	5.10	5.2	5.34
<i>t-com</i>	-1.95	-.70	-1.21	-1.41	1.67
<i>t-crit value</i>	1.99	1.99	1.98	1.99	1.99
Cold -smoked <i>etags</i> cube					
Local Consumers	4.94	5.24	4.82	4.96	4.74
Non-Local Consumer	4.48	4.38	4.54	4.48	4.52
<i>t-com</i>	1.85	3.42*	1.29	2.02*	0.95
<i>t-crit value</i>	1.98	1.98	1.98	1.98	1.98
Sun-dried <i>etags</i> cube					
Local Consumers	5.66	4.94	5.24	4.56	4.94
Non-local Consumer	5.52	4.48	4.38	4.68	5.24
<i>t-com</i>	0.69 ^{ns}	1.85	3.42*	-0.42	-1.26
<i>t-crit value</i>	1.98	1.99	1.98	1.99	1.99

*-significant at 0.05 level of confidence

(7-point Hedonic Scale; 1=Dislike extremely, 4=Neither like nor dislike, 7=Like extremely)



consumers. The texture difference in sun-dried cube warrants further investigation in processing to ensure a universally accepted mouthfeel.

Etag-Based Liquid Seasoning

The hot-smoked *etags* liquid seasoning showed no significant difference in the general acceptability between consumer groups for most attributes, confirming its potential for broader appeal. However, both the cold-smoked and sun-dried *etags* liquid seasoning showed extremely strong and significant differences ($t_{\text{comp}} > t_{\text{crit}}$) across all attributes (color, aroma, clarity, taste, and overall acceptability) (Table 4). For the cold-smoked variant, local consumers showed significantly higher acceptability in all categories compared to non-local consumers. The intense smokiness likely contributes to the lower ratings in aroma and taste for non-locals. For the sun-dried variant, local consumers also rated this variant significantly higher across all attributes compared to non-local consumers.

It has been observed that certain sensory aspects of *etags*-based convenience food products vary, which supports Verlegh and Ittersum's

(2001) argument that there are differences in the desires and needs of different regions. Geographic segmentation is based on the idea that consumers in the same location have similar wants and needs. Therefore, it is important to develop a strategy to enter new markets and expand the market niche for *etags* and *etags*-based food products. While there were significant differences in the results, it is worth noting that the panelists' likeability ratings did not differ significantly. This suggests an opportunity to broaden the market niche for *etags* and *etags*-based convenience products.

Acceptability of Convenience-Type Food Products Considering Etag Variants

The ANOVA results indicate no significant differences ($F_{\text{comp}} < F_{\text{crit}}$) were found in the acceptability of aroma, taste, or overall acceptability based on *etags* variant (Table 5) for any of the three product forms (cube, granule, or liquid seasoning). This result implies that although individual consumer groups (local vs. non-local) showed strong preferences, when all consumers are grouped together, the average acceptability scores for the core sensory attributes (aroma,

Table 4

Comparison of Evaluators' Acceptability for Etag Liquid Seasoning

Evaluator	Color	Aroma	Texture	Taste	Overall Acceptability
Hot-smoked <i>etags</i> liquid seasoning					
Local Consumers	5.04	4.46	4.9	4.58	4.76
Non-local Consumer	5.04	4.92	4.88	5.12	5.02
<i>t-com</i>	0	-2.04	0.10	-2.53	-1.31
<i>t-crit value</i>	1.98	1.98	1.98	1.98	1.98
Cold-smoked <i>etags</i> liquid seasoning					
Local Consumers	5.10	4.56	4.78	4.64	4.86
Non-Local Consumer	3.70	2.86	3.04	3.06	3.14
<i>t-com</i>	5.53*	7.00*	7.37*	5.58*	7.09*
<i>t-crit value</i>	1.98	1.98	1.98	1.98	1.98
Sun-dried <i>etags</i> liquid seasoning					
Local Consumers	5.04	4.46	4.66	4.40	4.58
Non-local Consumer	4.16	3.24	3.18	3.10	3.46
<i>t-com</i>	3.39*	4.43*	5.97	4.57*	4.37*
<i>t-crit value</i>	1.98	1.98	1.98	1.98	1.98

*-significant at 0.05 level of confidence

(7-point Hedonic Scale; 1=Dislike extremely, 4=Neither like nor dislike, 7=Like extremely)



Table 5*Differences in the Acceptability of Convenience-Type Products in Terms of Etag Variant*

Evaluator	Color	Aroma	Taste	Overall Acceptability
Bouillon Cube				
Hot-smoked	4.94 ^a	5.04 ^a	4.84 ^a	5.02 ^a
Cold-smoked	4.80 ^b	5.24 ^a	4.96 ^a	4.74 ^a
Sun-dried	5.66 ^a	5.16 ^a	4.56 ^a	4.94 ^a
<i>F-com</i>	6.92*	0.27	1.01	0.65
<i>F-crit value</i>	3.06	3.06	3.06	3.06
Granule				
Hot-smoked	5.14 ^b	4.88 ^a	5.14 ^a	5.16 ^a
Cold-smoked	4.96 ^a	4.96 ^a	4.52 ^a	4.92 ^a
Sun-dried	5.54 ^b	5.02 ^a	4.86 ^a	5.06 ^a
<i>F-com</i>	3.17*	0.15	2.87	0.69
<i>F-crit value</i>	3.06	3.06	3.06	3.06
Liquid Seasoning				
Hot-smoked	5.04 ^a	4.46 ^a	4.58 ^a	4.76 ^a
Cold-smoked	5.10 ^a	4.56 ^a	4.64 ^a	4.86 ^a
Sun-dried	5.04 ^a	4.46 ^a	4.40 ^a	4.58 ^a
<i>F-com</i>	0.04	0.09	0.39	0.66
<i>F-crit value</i>	3.06	3.06	3.06	3.06

*significant at 0.05 level of confidence

(7-point Hedonic Scale; 1=Dislike extremely, 4=Neither like nor dislike, 7=Like extremely)

taste, overall) for the hot-smoked, cold-smoked, and sun-dried *etags* variants are statistically similar. This indicates that, despite the sensory differences in smoke intensity (cold-smoked vs. hot-smoked) and flavor type (smoked vs. sun-dried), all three variants achieve an acceptable level (computed means are all above 4.5, which is between 'Neither like nor dislike' and 'Like slightly'). The finding that all variants have market potential is supported by this overall acceptable mean, even with the internal consumer group differences.

The developed *etags* convenience products demonstrate that the traditional flavor and color of *etags* can be successfully transferred to modern food matrices. The major challenge lies in geographical market segmentation: the strong, intense flavor of the cold-smoked variant is highly preferred by local consumers but significantly less accepted by non-local consumers across

all product forms (granule, cube, and liquid), confirming the argument by Verlegh and Ittersum (2001). Furthermore, the liquid seasoning format requires immediate refinement of the production process to improve clarity and reduce the 'muddy' descriptor, a technical defect that severely harmed its acceptability.

Conclusions

The study concludes that the developed bouillon cube, granule, and liquid seasoning successfully replicate the traditional sensory identity of *etags*. The flavor profiles are distinct and directly determined by the preservation method: cold-smoked products offer a very intense smoke flavor, hot-smoked variants provide a moderate smokiness, and sun-dried products retain the characteristic, non-smoked



cured pork flavor. While the color of the products remained almost similar to the original meat, ranging from butter yellow for sun-dried to dark amber for smoked variants, the physical formats presented specific textural challenges. Specifically, while bouillon cube achieved a high-quality, fine texture, the granule suffered from clumpiness, and the liquid seasoning exhibited a "muddy" appearance due to residual lipids and proteins.

In terms of consumer acceptability, the research concludes that geographic origin and flavor familiarity are the primary drivers of product preference. The hot-smoked and sun-dried variants demonstrated universal appeal, showing no significant difference in liking between local and non-local consumers across most attributes. Conversely, the cold-smoked variant serves as a polarizing niche product; it is highly accepted by local consumers who value its authentic intensity but is less palatable to non-local consumers. Despite these regional variations, all product variants achieved an overall acceptability score above the neutral threshold (4.5 on a 7-point scale), indicating a good foundational potential for the entire product line to enter the convenience food market.

Recommendations

To bridge the gap between traditional flavor and commercial quality standards, the production process must be refined to address format-specific defects. It is recommended that filtration techniques, such as centrifugation or the use of clearing agents, be implemented for the liquid seasoning to eliminate turbidity and achieve the clarity expected in commercial extracts. For the granule, the incorporation of food-grade anti-caking agents and the standardization of particle size are necessary to improve flowability and prevent clumping. Additionally, maintaining strict control over smoking durations and temperatures is essential for ensuring that the sensory profiles remain consistent and reproducible in a commercial setting.

Market entry strategies may be segmented to reflect these regional preferences. The hot-smoked and sun-dried bouillon cube and granule should be prioritized for wider national distribution due to their high acceptance scores

across all consumer segments. For the cold-smoked products, a targeted marketing approach is recommended, positioning them as "Heritage" or "Authentic Cordilleran" seasonings for local or specialty niche markets. Furthermore, for non-local expansion, producers might consider "mild" versions of the cold-smoked variant to lower the sensory barrier. Finally, conducting longitudinal shelf-life studies and in-home cooking trials is recommended to validate product performance and stability in real-world consumer environments.

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