



## Research Article

# Physicochemical and organoleptic properties of hot-air dried oriental melon slices prepared using different physical pretreatments

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**Abstract** The oriental melon poses challenges in terms of long-term storage and distribution. Addressing these issues requires an extension of the storage life through appropriate processing. In this study, pretreated hot-air dried oriental melon slices (steamed and freeze-thawed) were prepared, and their physicochemical and organoleptic properties were examined. The control group (CON) consisted of hot-air dried oriental melon slices without pretreatment, while the steamed group (STG) and freeze-thawed group (FTG) consisted of hot-air dried oriental melon slices pretreated using steaming and freeze-thawing methods, respectively. The moisture contents detected in the CON, STG, and FTG groups ranged from 15.96% to 27.30%, with variations of 7.53 to 8.40 °Brix for the soluble solid contents. The CON group showed the highest Hunter color value for lightness (L\*) and the lowest value for redness (a\*). The texture profile analysis revealed the highest hardness and chewiness in the order of STG > CON > FTG. Considerable differences were observed in springiness and adhesiveness in the FTG group compared to the other groups. The organoleptic evaluation showed that the CON group had the highest sensory scores for overall preference. These findings indicate that the properties of hot-air dried oriental melon slices were influenced by physical pretreatments and that manufacturing these slices without pretreatment is the most effective method in terms of processing simplicity and cost efficiency.

**Keywords** dried oriental melon slice, hot-air drying, steaming, freeze-thawing

## 1. Introduction

Oriental melon (*Cucumis melo* L. var. *makuwa*), a member of the Cucurbitaceae family, is a valuable crop from a nutritional point of view and a representative summer fruit in Korea (Park et al., 2020; Park et al., 2023). The popularity of Korean oriental melon is growing, with exports showing significant increases from 215 tons in 2018 to 415 tons in 2020 (Kim et al., 2023). The oriental melon is a variant that is unlike other melons, such as cantaloupe, honeydew, and muskmelon, as it differs in appearance, taste, and aroma (Kim et al., 2014a; Koo et al., 2019). It is characterized by smooth, light-yellow skin with white sutures and an inner flesh surrounding a central placenta containing seeds (Liu et al., 2012). The flesh has a sweet and crisp taste, as well as a unique and appealing aroma (Kim et al., 2014b) determined mainly by ester compounds,

such as (Z)-6-nonenyl acetate, (Z)-3-nonenyl acetate, ethyl 3-(methylthio) propanoate, and (Z,Z)-3,6-nonadienyl acetate (Kim et al., 2010).

According to the Korean Food Composition Tables published by the Rural Development Administration, the main component of the oriental melon is water (~86%), followed by sugars (~9%) (KFCD, 2023). This melon is also rich in minerals, including potassium, phosphorus, and calcium, as well as vitamins A and C, and folate (Hwang et al., 2005; KFCD, 2023). Additionally, it contains cucurbitacins, which are representative functional components with high anti-cancer activity and particularly good effectiveness against prostate cancer (Kim et al., 2014a; Shin et al., 2008). Despite these benefits, oriental melon poses challenges for long-term storage and distribution because it is intensively produced during the summer and is susceptible to cold-induced injuries at low storage temperatures (Lee et al., 1999; Lee et al., 2005b; Park et al., 2000). Therefore, improvements are needed in the storability of oriental melon through appropriate processing, along with the development of new products using the fruit. Indeed, studies are ongoing to develop various processed foods, such as juice (Shin et al., 1978), pickles (Lee et al., 1992), vinegar (Lee et al., 2002), wine (Hwang et al., 2015), jelly (Lee et al., 2004), and jam (Lee et al., 2005a), to improve the storability of oriental melon.

Various processing technologies are available to enhance food storability. Drying treatments are common methods widely used in the food industry, especially for water-rich vegetables and fruits, because drying can improve the storability and transportability of food by removing moisture (Koo et al., 2019; Lee and Kim, 2015). Drying methods include natural drying methods, such as sun drying, and artificial drying methods, such as freeze drying, infrared drying, cold-air drying, and hot-air drying (Hong and Lee, 2004). Among the artificial drying methods, hot-air drying is widely used because it is economical and simple and offers short drying times. However, the rapid moisture loss that occurs during hot-air drying can lead to shrinkage, surface hardening, and browning reactions that deteriorate the quality of hot-air dried products (Shin and Lee, 2011; So et al., 2016).

The quality deterioration caused by hot-air drying can be moderated by various pretreatment methods, such as blanching using steam or boiling water, adding organic acids, and soaking in salt or sugar solutions (So et al., 2016; Youn et al., 1997). Therefore, combining hot-air drying with an appropriate pretreatment can be an excellent strategy for

improving the storability of food. In light of these considerations, various hot-air dried fruits and vegetables, such as persimmon (Kim et al., 2009), radish (Kim et al., 2015), zucchini (Song et al., 2022), and sweet potato (Lee et al., 2023), are being produced and studied. However, reports on hot-air dried oriental melon slices are scarce, and to our knowledge, almost no research has been conducted on hot-air dried oriental melon slices made exclusively with physical pretreatments without any additional ingredients. Given the food industry trend that caters to consumers who increasingly prefer additive-free natural foods, the production of hot-air dried oriental melon slices using solely physical pretreatment methods would be a welcome innovation in the consumer market from an industrial perspective.

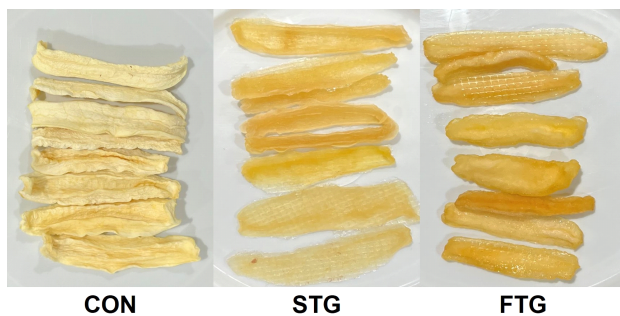
Building on the known benefits of hot-air drying for improved oriental melon storability, the aim of this study was to address the lack of research on physical pretreatment methods for producing hot-air dried oriental melon slices. Here, oriental melon slices were prepared using steaming or freeze-thawing pretreatments, followed by hot-air drying. The physicochemical and organoleptic properties of the resulting slices were compared and analyzed to establish fundamental data for the commercial production of high-quality hot-air dried oriental melon slices.

## 2. Materials and methods

### 2.1. Materials and pretreatments

For this experiment, oriental melons (*Cucumis melo* L. var. *makuwa*) were purchased in 2022 from the Byeokjin Nonghyup Agricultural Product Processing Center in Seongju, South Korea. After washing the melons under running water, the skin was removed, and the flesh was divided into eight equal wedges along the longitudinal axis. The placenta was then discarded. From each melon, eight wedges were randomly selected and grouped together into a total of three groups. As shown in Fig. 1, the control group (CON) consisted of melon slices dried at 40°C for 36 h without any pretreatment. The steamed group (STG) included slices steamed for 5 min, cooled at room temperature for 10 min, and then dried at 40°C for 36 h. The freeze-thawed group (FTG) comprised slices frozen at -20°C for 7 days, thawed at room temperature for 11 h, and then dried at 40°C for 24 h. All subsequent experiments and analyses were conducted on these three groups.

The experimental conditions, such as temperature and



**Fig. 1.** Grouping of hot-air dried oriental melon slices according to pretreatments. CON, hot-air dried oriental melon slices without pretreatment; STG, hot-air dried oriental melon slices pretreated using a steaming method; FTG, hot-air dried oriental melon slices pretreated using a freeze-thawing method.

drying time, were established through preliminary experiments (data not shown). However, to better align with the specific requirements of this experiment, the original protocol described in the Kim (2021) patent was partially modified for the FTG group. The prepared samples were sealed in groups of three and stored in a  $-20^{\circ}\text{C}$  freezer.

## 2.2. Moisture content measurement

The moisture content of the dried melon slices was determined using the normal pressure drying method. Each sample (2.0 g) was placed in a cabinet oven (JSOF-150, JSR Co., Gongju, Korea) and dried at  $105^{\circ}\text{C}$  until a constant weight was reached. The moisture content was then calculated.

## 2.3. Soluble solids measurement

The soluble solids content (sugar content) of the dried melon slices was measured as follows. The sample (5.0 g) was mixed with 45 mL of distilled water and homogenized using a homogenizer (JP/AM-9, Nihonseiki Kashima Co., Tokyo, Japan) at 10,000 rpm for 2 min. After centrifugation in an ultracentrifuge (CP100WX & CS150NX, Hitachi Co., Tokyo, Japan) at  $4^{\circ}\text{C}$ , 8,000 rpm for 15 min, the soluble solids content was then measured using a refractometer (master- $\alpha$ , Atago Co., Tokyo, Japan) and expressed as  $^{\circ}\text{Brix}$ .

## 2.4. Color value assessment

The colors of the surface and inside of the dried melon slices were measured using a colorimeter (CR-400, Konica Minolta Co., Tokyo, Japan) calibrated with a standard white plate ( $L^*=97.79$ ,  $a^*=-0.38$ ,  $b^*=2.05$ ), and expressed in terms

of lightness ( $L^*$ ), redness ( $a^*$ ), and yellowness ( $b^*$ ) values.

## 2.5. Texture profile analysis

The texture of the dried melon slices was determined using a rheometer (Compac-100II, Sunscientific Co., Tokyo, Japan). The measurement conditions were as follows: test type (mode 21), adaptor type (No. 4), probe penetration distance (15 mm), table speed (60 mm/min), and maximum load cell stress (2 kg). Hardness, chewiness, springiness, adhesiveness, and cohesiveness were determined by performing duplicate measurements at the center of each sample.

## 2.6. Sensory evaluation

A sensory evaluation was conducted by recruiting 16 students from Kyungpook National University. To ensure the safety of the sensory panelists, only samples dried on the same day were used. The test was conducted after fully explaining the purpose and method of the sensory evaluation. The panelists assessed several attributes, such as overall acceptability, appearance, color, flavor, sweetness, bitterness, chewiness, and elasticity, using a 7-point scale. For overall acceptability, appearance, color, and flavor, higher scores indicated a higher preference. For sweetness, bitterness, chewiness, and elasticity, higher scores indicated stronger intensity. The sensory evaluation was conducted safely after receiving exemption approval from the Kyungpook National University Institutional Review Board (Approval number: KNU-2022-0272).

## 2.7. Statistical analysis

All statistical analyses were conducted using SPSS software (Version 26, IBM-SPSS Inc., Thomwood, NY, USA). The results obtained from the experiment were assessed using analysis of variance (ANOVA). For measures with statistically significant differences in the ANOVA, a post-hoc Tukey HSD test was conducted ( $p<0.05$ ). In cases where the normality test was not passed, the Kruskal-Wallis non-parametric test was used to assess significance ( $p<0.05$ ).

# 3. Results and discussion

## 3.1. Moisture and soluble solids content of dried oriental melon slices

As shown in Table 1, the CON, STG, and FTG samples

**Table 1.** Moisture and sugar content of hot-air dried oriental melon slices prepared using different pretreatments

Group <sup>1)</sup>	Moisture content (%)	Soluble solids (°Brix)
CON	16.43±1.35 <sup>b2)</sup>	8.33±0.12 <sup>a3)</sup>
STG	15.96±1.80 <sup>b</sup>	8.40±0.10 <sup>a</sup>
FTG	27.30±3.59 <sup>a</sup>	7.53±0.31 <sup>b</sup>

<sup>1)</sup>CON, hot-air dried oriental melon slices without pretreatment; STG, hot-air dried oriental melon slices pretreated using a steaming method; FTG, hot-air dried oriental melon slices pretreated using a freeze-thawing method.

<sup>2)</sup>Values are mean±SD (n=15). <sup>a,b</sup>Means with different letters in each column are significantly different (p<0.05) by the Tukey HSD test.

<sup>3)</sup>Values are mean±SD (n=3). <sup>a,b</sup>Means with different letters in each column are significantly different (p<0.05) by the Tukey HSD test.

had moisture contents of 16.43, 15.96, and 27.30%, respectively. The CON and STG samples showed similar moisture contents, whereas FTG samples had a significantly higher moisture content (p<0.05). This difference can be attributed to the variations in hot-air drying time rather than the pretreatment method. The CON and STG samples were dried for 36 h, whereas the FTG samples were dried for 24 h. The shorter drying time for the FTG samples likely resulted in a higher moisture content. This drying time was chosen based on the 24 h drying time recommended in a patent for the production of hot-air dried oriental melon slices pretreated using freeze-thawing (Kim, 2021). Interestingly, the STG samples showed similar moisture content to the CON samples despite the steam pretreatment. This may reflect the similar hot-air drying time applied to both groups. Therefore, the final moisture content of dried oriental melon slices appears to be primarily influenced by the hot-air drying time rather than the pretreatment method. This finding is consistent with previous studies that reported a decrease in the moisture content of dried oriental melon slices with increasing hot-air drying time (Kim et al., 1997; Koo et al., 2019).

Measurement of the soluble solids content (SSC) of the dried oriental melon slices prepared using different pretreatments showed that the CON, STG, and FTG samples had SSC values of 8.33, 8.40, and 7.53 °Brix, respectively. The similar SSC values for the CON and STG samples suggested that the steam pretreatment did not significantly affect the SSC of dried oriental melon slices. By contrast, the FTG samples had a significantly lower SSC value than the other groups. This difference can be attributed to two factors. First, the FTG

group underwent a freeze-thawing pretreatment. During freezing, ice crystal formation and expansion within the oriental melon flesh disrupt the cellular structure, leading to tissue softening and damage. Thawing then releases the soluble solids, which are incorporated into the water and lost to a significant extent during drying. This is considered the primary reason for the lower SSC of the FTG samples compared to the other groups. The second factor is the inverse relationship between moisture content and SSC. Several studies have reported that higher moisture content is associated with lower SSC, and vice versa (Kim et al., 2009; Koo et al., 2019; Lee et al., 2014). As mentioned earlier, the moisture content was relatively higher in the FTG samples than in the other groups. Consequently, this high moisture content likely contributed to the lower SSC value of the FTG samples. In general, low SSC in fruits is often associated with low sweetness. Therefore, these results suggest that the freeze-thawing pretreatment may negatively affect the sweetness of hot-air dried oriental melon slices.

### 3.2. Color of dried oriental melon slices

Color value measurement is a common technique used to assess the appearance of dried oriental melon slices prepared with different pretreatments. As shown in Table 2, the lightness of the slice surface was highest for CON (80.02) and lowest for FTG (69.72). Similarly, the lightness of the inside was also highest for CON (76.53) and lowest for FTG (69.07), indicating the same trend for both surface and inside lightness. These results suggest that steaming or freeze-thawing pretreatments reduce the lightness of hot-air dried oriental melon slices.

Conversely, the redness of the slice surface was higher in the order of FTG, STG, and CON. This shows that freeze-thawing and steaming pretreatments promote the browning of hot-air dried oriental melon slices. Generally, lightness and redness are well-known browning indicators since a decrease in lightness and an increase in redness indicate browning (So et al., 2016). This browning in dried oriental melon slices is a phenomenon caused by heat during long-term drying at high temperature, as described in previous studies (Koo et al., 2019). Unlike the increase in surface redness caused by browning, no significant differences were observed for the redness of the inside in any of the three groups. This suggests that the surface of oriental melon slices was more affected

**Table 2.** Hunter color values of hot-air dried oriental melon slices prepared using different pretreatments

Part	Group <sup>1)</sup>	Hunter's color <sup>3)</sup>		
		L*	a*	b*
Surface	CON	80.02±9.88 <sup>a2)</sup>	-0.41±1.28 <sup>b</sup>	21.92±3.17 <sup>a</sup>
	STG	73.83±11.22 <sup>ab</sup>	0.21±1.64 <sup>ab</sup>	23.09±3.93 <sup>a</sup>
	FTG	69.72±3.93 <sup>b</sup>	0.87±1.50 <sup>a</sup>	23.45±4.45 <sup>a</sup>
Inside	CON	76.53±7.59 <sup>a</sup>	0.27±1.10 <sup>a</sup>	25.21±3.15 <sup>a</sup>
	STG	71.61±8.66 <sup>ab</sup>	0.46±1.63 <sup>a</sup>	24.97±3.17 <sup>a</sup>
	FTG	69.07±3.40 <sup>b</sup>	0.29±1.35 <sup>a</sup>	24.52±1.64 <sup>a</sup>

<sup>1)</sup>CON, hot-air dried oriental melon slices without pretreatment; STG, hot-air dried oriental melon slices pretreated using a steaming method; FTG, hot-air dried oriental melon slices pretreated using a freeze-thawing method.

<sup>2)</sup>Values are mean±SD (n=24). <sup>a,b)</sup>Means with different letters in each column are significantly different (p<0.05) by the Kruskal-Wallis test.

<sup>3)</sup>L\*, lightness; a\*, redness; b\*, yellowness.

than the inside during hot-air drying and that the surface browned faster.

The yellowness of the slices showed similar values for both the surface and the inside, and no statistically significant difference was detected among the three groups. These results imply only a minimal influence of freeze-thawing and steaming pretreatments on the yellowness of hot-air dried oriental melon slices. Overall, the color analysis indicated that hot-air drying without any pretreatment is the most effective method for producing dried oriental melon slices with minimal browning and with color retention closest to that of the original flesh.

### 3.3. Texture of dried oriental melon slices

The texture of dried oriental melon slices prepared using different pretreatments was evaluated based on hardness, chewiness, springiness, adhesiveness, and cohesiveness (Table 3). The STG samples had the highest hardness (9,985.26 gf/cm<sup>2</sup>), followed by the CON (6,648.48 gf/cm<sup>2</sup>) and FTG (3,718.75 gf/cm<sup>2</sup>) samples, indicating that the steaming

pretreatment significantly increased the hardness of the melon slices. Chewiness followed a similar high-to-low pattern of STG (223.89 gf/cm<sup>2</sup>), CON (117.01 gf/cm<sup>2</sup>), and FTG (78.78 gf/cm<sup>2</sup>). This association between hardness and chewiness likely arises because samples with greater hardness require more energy for mastication to achieve a swallowable consistency. Both the CON and STG samples exhibited similar springiness (89.46% and 86.70%, respectively), whereas the FTG samples showed a significantly lower value (59.50%). As with springiness, the adhesiveness was significantly lower for the FTG samples (18.82 gf/cm<sup>2</sup>) than for the CON and STG samples, which had statistically similar values (63.14 gf/cm<sup>2</sup> and 48.18 gf/cm<sup>2</sup>, respectively).

Overall, the FTG samples showed significant differences in several textural parameters compared to the other two groups. Previous studies have determined that moisture content is the main factor determining the texture of dried foods; therefore, the differences can be attributed to the relatively high moisture content of the FTG samples (Lee et al., 2023; Mazumder et al., 2007). By contrast, all three groups showed

**Table 3.** Texture profile analysis of hot-air dried oriental melon slices prepared using different pretreatments

Group <sup>1)</sup>	Hardness (gf/cm <sup>2</sup> )	Chewiness (gf/cm <sup>2</sup> )	Springiness (%)	Adhesiveness (gf/cm <sup>2</sup> )	Cohesiveness (%)
CON	6,648.48±2,171.26 <sup>b2)</sup>	117.01±41.08 <sup>b</sup>	89.46±37.63 <sup>a</sup>	63.14±23.47 <sup>a</sup>	25.17±4.51 <sup>a</sup>
STG	9,985.26±1,713.16 <sup>a</sup>	223.89±159.55 <sup>a</sup>	86.70±23.26 <sup>a</sup>	48.18±13.62 <sup>a</sup>	32.56±23.63 <sup>a</sup>
FTG	3,718.75±1,653.79 <sup>c</sup>	78.78±46.96 <sup>c</sup>	59.50±21.36 <sup>b</sup>	18.82±18.86 <sup>b</sup>	30.17±10.23 <sup>a</sup>

<sup>1)</sup>CON, hot-air dried oriental melon slices without pretreatment; STG, hot-air dried oriental melon slices pretreated using a steaming method; FTG, hot-air dried oriental melon slices pretreated using a freeze-thawing method.

<sup>2)</sup>Values are mean±SD (n=22). <sup>a-c)</sup>Means with different letters in each column are significantly different (p<0.05) by the Kruskal-Wallis test.

similar cohesiveness, which reflects the internal bonding strength within the food matrix, indicating that neither freeze-thawing nor steaming had any significant effect on the cohesiveness of hot-air dried oriental melon slices.

### 3.4. Sensory properties of dried oriental melon slices

The sensory evaluation results for determining the quality of hot-air dried oriental melon slices are shown in Table 4. Visual assessment of the appearance and color revealed no significant differences among the three groups. Unexpectedly, despite experimental results indicating browning, the STG and FTG groups received slightly higher preference scores than the CON group in the sensory evaluation. This suggests a favorable perception of browning in dried oriental melon slices, although no significant differences were evident in the sensory evaluation. Similarly, no significant differences were observed in the bitterness scores among the three groups. These findings imply that freeze-thawing and steaming pretreatments did not noticeably affect melon slice bitterness.

The elasticity scores showed a slight discrepancy from the previous texture profile analysis (TPA) results. The FTG samples had significantly lower springiness than the other two groups, whereas no significant differences were reported in the sensory evaluation. This suggests that the degree of springiness distinguishable at the instrumental level was not readily perceptible in the sensory evaluation. Conversely, the STG samples, which showed the highest hardness and chewiness in the TPA, also received the highest score for chewiness in the sensory evaluation. This consistent trend suggests that a steaming pretreatment during the preparation of hot-air dried oriental melon slices requires caution, as it can cause excessive chewiness due to increased hardness.

In the sweetness score, the CON samples received the highest score, and the difference in sweetness compared to the STG group was statistically significant. This difference is difficult to reconcile with the lack of a significant difference in the SSC measurements between CON and STG. In general, fruit taste is influenced by the sugar content (Zhang and Lee, 2005). However, oriental melon has shown a low correlation between its sweetness and SSC (Lee et al., 2017), potentially explaining the observed inconsistency in our study. In addition, the perception of sweetness can be influenced by the fruit flavor. Since flavor is determined by the combination of taste and aroma, flavor and taste are closely related. The CON sample flavor received a significantly higher score of 6.44 compared to the STG' group's score of 4.44. Therefore, the relatively superior flavor evaluation of CON may have led to the perception that the CON samples were sweeter than the STG samples and created a discrepancy between the actual SSC results and the sweetness score given in the sensory evaluation.

In terms of overall acceptability, no significant difference was detected between the three groups, although the CON samples garnered the highest score in the sensory evaluation. This implies that producing hot-air dried oriental melon slices without any freeze-thawing or steaming pretreatment will generate products with high overall acceptability. Furthermore, if the pretreatment can be omitted, the manufacturing process can be simplified, leading to cost reductions. Therefore, the results of this sensory evaluation showing that hot-air dried oriental melon slices without pretreatment achieved high acceptability are meaningful from an economic perspective.

## 4. Conclusions

In this study, oriental melon slices were prepared using

**Table 4.** Sensory properties of hot-air dried oriental melon slices prepared using different pretreatments

Group <sup>1)</sup>	Sensory properties							
	Appearance	Color	Flavor	Sweetness	Bitterness	Chewiness	Elasticity	Overall acceptability
CON	5.00±1.71 <sup>a2)</sup>	4.63±1.54 <sup>a</sup>	6.44±0.51 <sup>a</sup>	5.88±1.09 <sup>a</sup>	1.88±1.26 <sup>a</sup>	4.00±1.46 <sup>b</sup>	4.13±1.67 <sup>a</sup>	5.75±1.34 <sup>a</sup>
STG	4.69±1.45 <sup>a</sup>	5.06±1.48 <sup>a</sup>	4.44±1.50 <sup>b</sup>	4.75±1.48 <sup>b</sup>	1.50±0.73 <sup>a</sup>	5.50±1.59 <sup>a</sup>	4.88±1.86 <sup>a</sup>	4.94±1.65 <sup>a</sup>
FTG	4.81±1.52 <sup>a</sup>	5.38±1.41 <sup>a</sup>	4.69±1.54 <sup>b</sup>	5.06±1.12 <sup>ab</sup>	1.94±1.48 <sup>a</sup>	4.19±1.22 <sup>b</sup>	4.81±1.38 <sup>a</sup>	5.13±1.26 <sup>a</sup>

<sup>1)</sup>CON, hot-air dried oriental melon slices without pretreatment; STG, hot-air dried oriental melon slices pretreated using a steaming method; FTG, hot-air dried oriental melon slices pretreated using a freeze-thawing method.

<sup>2)</sup>Values are mean±SD (n=16). <sup>a,b</sup>Means with different letters in each column are significantly different (p<0.05) by the Kruskal-Wallis test.

steaming or freeze-thawing pretreatments, followed by hot-air drying. The physicochemical and organoleptic properties of the resulting slices were then compared and analyzed to establish fundamental data for producing high-quality hot-air dried oriental melon slices. The moisture content of the hot-air dried oriental melon slices was significantly higher in samples pretreated by freeze-thawing (FTG) than without pretreatment (CON) or pretreatment by steaming (STG). Conversely, the soluble solids content was significantly lower in the FTG samples. In terms of color, the CON samples had the highest lightness ( $L^*$ ) and the lowest redness ( $a^*$ ), with no significant difference in yellowness ( $b^*$ ) among the groups. This indicates that only the CON treatment produced dried oriental melon slices with a color similar to that of the original melon flesh, without browning. The textures of hardness and chewiness were highest in the STG samples, followed by the CON and FTG samples. The FTG samples showed significant differences in springiness and adhesiveness compared to the other two groups, but no significant differences were noted in cohesiveness among the three groups. The sensory evaluation results showed that, despite a lack of significant differences in overall acceptability, the CON samples were evaluated highest in terms of sensory acceptability compared to the other two groups. The CON samples also received significantly higher scores for flavor and sweetness. The sensory findings suggest that producing dried oriental melon slices by hot-air drying without any pretreatment is a simple and cost-effective method for obtaining products with high overall consumer acceptability.

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### Conflict of interests

The authors declare no potential conflicts of interest.

### Author contributions

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### Ethics approval

The sensory evaluation of this research was safely carried out with the approval of exemption (No. KNU-2022-0272) from the IRB of Kyungpook National University.

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