25 YEARS

Consumer perception of purple-fleshed sweet potatoes: hedonic, sensory, and emotional expectations

Percepción de los boniatos de pulpa violeta: expectativas hedónicas, sensoriales y emocionales de los consumidores

Percepção da batata-doce de polpa roxa: expectativas hedonicas, sensoriais e emocionais dos consumidores

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Abstract

Purple-fleshed sweet potatoes (PFSP) are a new product for Uruguayan consumers. It shows differentiable sensory characteristics and added nutritional benefits, but sensory and hedonic expectations raised by PFSP have not been explored yet in Uruguay. The aim of this work was to explore Uruguayan consumers' perception of PFSP with a special focus on the hedonic, sensory and emotional expectations raised by them in comparison to traditional yellow and orange-flesh genotypes available in the market. A series of pictures of three types of SP were used in a social-network-driven study completed by 179 SP consumers. A word-association task and rating of expected liking together with exploring how they would feel after consumption using a check-all-that-apply (CATA) question composed of 21 emoji were carried out. Participants were also asked to describe the expected sensory characteristics using a CATA questions composed of 17 terms, selected based on results from previous sensory studies. Results revealed a lack of consumer familiarity with purple flesh coloration and lower expected liking scores compared to traditional orange and yellow flesh genotypes. It was also associated with scarce positive hedonic and emotional associations related to the emojis flushed face (😳), face screaming in fear (😱), grimacing face (😬) and weary face (😩). Moreover, they were expected to have similar characteristics to yellow-fleshed sweet potatoes (YFSP) in terms of texture and flavor, being also associated with off-flavors presence. This highlights the need to develop diverse marketing strategies to increase familiarity before the commercial release of PFSP.

Keywords: consumers, breeding, sweet potato, texture, flavor

Resumen

Los boniatos de pulpa violeta (BPV) constituyen un producto novedoso para los consumidores uruguayos. Presentan características fácilmente diferenciables, así como un valor nutricional añadido, pero aún se desconocen las expectativas sensoriales y hedónicas que generan en Uruguay. El objetivo de este trabajo fue explorar la percepción de los BPV con un foco especial en las expectativas hedónicas, sensoriales y emocionales en comparación con los tipos tradicionales

presentes en el mercado. El estudio fue realizado con 179 consumidores que respondieron preguntas *online*, presentándoles una serie de fotografías. Se realizó una asociación libre y la evaluación de aceptabilidad esperada, y se exploró cómo se sentirían luego de probarlos, utilizando un «marque todo lo que corresponda» (CATA) compuesto de 21 *emojis*. También se solicitó a los participantes que describieran sus expectativas sensoriales aplicando un CATA compuesto por 17 términos validados en ensayos previos. Los resultados muestran una falta de familiaridad con la coloración violeta en la pulpa, lo que se refleja en menores valores de aceptabilidad esperada en comparación con los genotipos tradicionales de pulpa crema y naranja. Se asoció también con escasas asociaciones hedónicas positivas y *emojis* como cara de asombro (😳) o miedo (😱), muecas (😬) o fatiga (😩). Generaron expectativas sensoriales similares a los boniatos de pulpa crema en términos de textura y sabor, asociándose, además, con sabores no deseados. Esto resalta la necesidad de desarrollar estrategias de *marketing* para favorecer la familiaridad previo a la liberación comercial de los BPV.

Palabras clave: consumidores, mejoramiento genético, boniato, textura, sabor

Resumo

A batata-doce com polpa violeta (BPV) é uma novidade para o consumidor uruguaio. Apresentam características facilmente diferenciáveis e valor nutricional agregado, mas as expectativas sensoriais e hedônicas que geram no Uruguai ainda são desconhecidas. O objetivo deste trabalho foi explorar a percepção do BPV com foco especial nas expectativas hedônicas, sensoriais e emocionais em comparação com os tipos tradicionais presentes no mercado. O estudo foi conduzido por 179 consumidores que responderam a perguntas online, apresentando-lhes uma série de fotos. Foi realizada uma avaliação de associação livre e aceitabilidade esperada e explorado como eles se sentiriam depois de experimentá-los, usando uma marca de seleção todos que se aplicam (CATA) composta por 21 emojis. Os participantes também foram solicitados a descrever suas expectativas sensoriais, aplicando um CATA composto por 17 termos validados em ensaios anteriores. Os resultados mostram um desconhecimento da coloração violeta da polpa, o que se reflete em menores valores de aceitabilidade esperada em relação aos genótipos tradicionais de polpa creme e laranja. Também foi associado a poucas associações hedônicas positivas e emojis, como rosto surpreso (😳) ou medo (😱), caretas (😬) o fadiga (😩). Eles geraram expectativas sensoriais semelhantes à polpa cremosa de batata-doce em termos de textura e sabor, e também foram associados a sabores indesejados. Isso destaca a necessidade de desenvolver estratégias de marketing para promover a familiaridade antes do lançamento comercial da batata-doce de polpa roxa.

Palavras-chave: consumidores, melhoramento genético, batata doce, textura, sabor

1. Introduction

Sweet potato (SP) is a versatile crop. Roots can be prepared in different ways, such as boiled, baked, steamed or fried, and included in a diverse range of food preparations. In developed countries, SP has been currently reevaluated as a health promoting food due to its nutritional composition and content of functional components such as anthocyanins, carotenoids, and phenolic compounds[1]. In Europe, there is an exponentially rising consumer demand linked to the interest in ethnic vegetables facilitated by globalization and nutraceutical research, sustaining a 100% increment during 2010 and 2015[2].

Different SP genotypes present contrasting sensory characteristics as well as a diverse composition of vitamins, pigments and dietary fiber[2-3]. They also differ in their dry matter (DM), which directly influences texture after cooking; high DM genotypes are firm and mealy, whereas low DM genotypes show a soggy texture after cooking[4-5]. SP cultivars are classified in four types according to root flesh color, dry matter, total sugar, and flavor: i) yellow or white sweet potato (Y or WFSP), dry, low sweetness or staple type; ii) orange, moist, sweet or dessert-type; iii) orange-fleshed sweet potato (OFSP), dry and starchy feeling rather bland in the mouth, and iv) purple-fleshed type (PFSP), usually dry and low sweetness[6].

In the specific case of Uruguay, SP is one of the main horticultural products consumed in the country (7.9 kg/inhab./year), being the 5th product in price and volume of commercialization[7]. YFSP (*criollo*) and OFSP (*zanahoria*, carrot) are commercially available in the marketplace. These commercial types of SP are available the whole year, with the lowest availability from October to December, with a total planted area of nearly 1500 ha and a year average production of 20.450 tons[8]. YFSP is a traditional product in the country, cultivated since the beginnings of the XIX century[9]. OFSP was introduced later and experienced a sharp rise during

early 2000, which can be explained by the adoption of this product by new consumers and an increase in the consumption by existent SP consumers[10]. In the last decade, OFSP has represented nearly 50% of local supply[7]. Meanwhile, PFSP genotypes are not yet available as commercial cultivars. In this sense, the incorporation of genotypes with novel characteristics in terms of color, flavor and texture could represent an opportunity to increase SP production and consumption in the country.

PFSP have light to intense purple coloration due to varying accumulation of anthocyanin pigments in their storage roots[2-3][11]. PFSP are known to have beneficial health effects and have been used as a source of natural food colorant due to their high levels of polyphenols, specially anthocyanins[12-13]. The anthocyanin content in storage roots of PFSP is comparable to that of other well-known anthocyanin-rich crops, like blueberries, blackberries, cranberries and grapes[14].

Stimulation of variety uptake and adoption along the different steps of the value chain mostly relies on improvements in demand-led breeding, which have re-directed research priorities to consumer's preferred traits, with a special focus on sensory acceptance attributes[15]. Consumer's preferences of a particular crop variety are influenced by quality attributes such as appearance, smell, texture, and taste, which must be explored and considered[16-17]. Appearance plays a key role in shaping consumer perception of fresh products, being one of the first sensory characteristics consumers take into account when evaluating quality and making their purchase decisions[18]. In this sense, the unfamiliar coloration of PFSP can generate diverse expectations among consumers of traditional orange and yellow-fleshed SP. Studies conducted in different countries worldwide have revealed that SP with unfamiliar colors can be well accepted by consumers as long as the other sensory characteristics (flavor, texture, aroma and basic taste) are well liked[19]. However, contrasting perceptions towards an unfamiliar color in SP can be expected depending on personal characteristics, such as age, gender, familiarity, neophobia, as well as contextual factors (food culture, religion, etc.)[16].

The sensory and hedonic expectations raised by PFSP among Uruguayan consumers have not been explored yet.

In this context, the present work aimed to explore Uruguayan consumers' perception of PFSP. Special focus was placed on the hedonic, sensory and emotional expectations raised by purple colored SP compared to traditional yellow and orange flesh genotypes commercialized in the Uruguayan market. Results were expected to provide relevant insights to inform breeding decisions and define marketing strategies for promoting new products based on consumers' expectations.
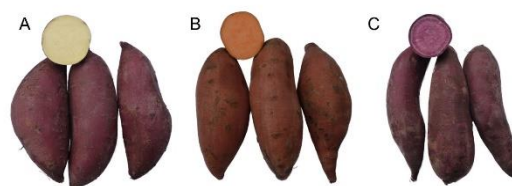
2. Materials and methods

2.1 Participants

A total of 179 SP consumers (78% female, ranging between 19 and 80 years old –mean=50.7, SD=14.0) participated in the study. They were recruited using an advertisement in Facebook and Instagram, targeted at Uruguayan adults (18 years and older). The advertisement included an image of vegetables and the text "We want to know your opinion", along with the logos of the institutions involved in the study (the National Agricultural Research Institute [INIA] and the University of the Republic). Interested participants clicked on the link and were re-directed to the website where the study was hosted. Participants were asked about their consumption of SP and only those who consumed it at least occasionally (at least once a month) were included in the study.

2.2 Stimuli

A series of pictures of three types of SP were used in the study: yellow-fleshed SP, orange-fleshed SP, and purple-fleshed SP (Figure 1). Each picture featured three roots and one sliced root, which enabled the visualization of flesh color. Pictures were taken under standardized conditions immediately after harvest from the experimental field located at INIA Salto Grande, Salto, Uruguay (31° 16′ 21′′S; 57° 53′ 27′′ W).

Figure 1. Pictures used in the study: Yellow-fleshed sweet potato (A), Orange-fleshed sweet potato (B), and Purple-fleshed sweet potato (C)

2.3 Questionnaire

First, participants were explained that the study aimed at understanding their perception of a series of vegetables, and were asked to provide their

informed consent using an online form. Then, they were presented with the pictures of the three types of SP, one by one following a balanced presentation order based on a Williams' Latin square experimental design. For each of the pictures, they were asked to complete a word association task. They were asked to write down the first words that came to their mind when looking at the picture.

After completing the word association task, they were presented with the three pictures again. In this second task, they were asked to rate their expected liking using a 9-point hedonic scale (1= 'dislike very much', 9 = 'like very much'), and to indicate how they would feel when consuming the SP shown in the picture using a check-all-that-apply (CATA) question composed of 21 emoji[20]: smiling face with smiling eyes (😊), smiling face with heart shaped eyes (😍), smiling face with smiling eyes and open mouth (😄), relieved face (😌), face with stuck out tongue (😛), winking face (😉), neutral face (😐), flushed face (😳), smirking face (😏), smiling face with sunglasses (😎), grimacing face (😬), face screaming in fear (😱), unamused face (😒), face with stuck out tongue and tightly closed eyes (😝), angry face (😠), confounded face (😖), nauseated face (🤢), weary face (😩), disappointed face (😞), crying face (😢), face with cold sweat (😰). They were also asked to describe the expected sensory characteristics of the SP using a CATA question composed of 17 terms, selected based on results from previous sensory studies[21-22]: sweet, tasty, typical SP flavor, firm, smooth, creamy, barely sweet, soft, moist, fibrous, off-flavor, tasteless, dry, pasty, tasteless, rough, bitter. The presentation order of the emoji and the sensory terms within the CATA question was balanced across participants following a Williams' Latin square experimental design. Finally, participants answered a series of socio-demographic questions (gender, age, education level, place of residence, number of children in the household) and were asked to state their consumption frequency of SP.

2.4 Data analysis

Data from the word association task were analyzed using content analysis[23]. Responses were grouped into categories as they emerged from the data, following an inductive coding process. A researcher with previous experience in content analysis coded the data, which was subsequently checked by a second researcher. The final coding was defined by consensus between the two researchers. The same procedure was used to group the categories into dimensions. The percentage of consumers who provided responses within each category was calculated for each of the three types of SP. The chi-square test was used to check the existence of associations between the categories and the types of sweet potatoes.

The average expected liking scores were calculated for each of the three types of SP. Analysis of variance (ANOVA) was run considering sample as fixed source of variation and Fisher's test was used for post-hoc comparisons ($p \leq 0.05$).

The frequency of use of each emoji/sensory term of the CATA question was calculated as the number of participants who used that emoji/term to describe each type of SP, expressed as percentage. Cochran's Q test was used to check the existence of significant differences among samples. When differences were significant, the sign test was used for post-hoc comparisons among types of SP. All statistical analyses were performed using R software[24].

3. Results

3.1 Consumers' associations with different types of SP

The associations raised by the pictures of the three types of SP were grouped into 37 categories, which were subsequently merged into 8 dimensions. As shown in Table 1, the most frequent responses were related to a description of the products shown in the pictures, being the category *Sweet potato* the most frequently mentioned.

Significant differences in the frequency of mention of the categories were found among the three types of SP ($c^2=484.09$, p<0.001). *Criollo* type SP were described as such, as participants mentioned words such as *criollo*, *boniato* and common. This type of SP was associated with the category *Tuber* more frequently than the rest (Table 1). OFSP were described as *zanahoria* (carrot), whereas purple sweet potatoes raised associations related to beetroot.

The pictures also raised associations related to dishes and culinary preparations (Table 1). OFSP were more frequently associated with the categories *Baked*, *Pot food* and *Soup* than the other two types, whereas purple SP were more frequently associated with the category *Salad*. Regarding associations related to sensory and characteristics, OFSP stood out for their association with sweetness and positive hedonic associations, whereas *criollo* SP

were associated with the categories *Yellow*, *Hard* and *Barely sweet*. Meanwhile, purple SP raised associations related to their distinct color, as well as their lack of familiarity, uniqueness and novelty (Table 1).

Table 1. Percentage of participants who provided responses within each of the categories identified in the word association task, for each of the three types of SP

Dimension	Category	Examples	YFSP	OFSP	PFSP
Product description	Sweet potato	Sweet potato (SP)	59 (+)	43 (-)	59 (+)
	Zanahoria	*Zanahoria* sweet potato	0 (-)	43 (+)	1 (-)
	Beetroot	Beetroot	0 (-)	0 (-)	23 (+)
	Criollo	Common SP, *criollo*, *boniato*	17 (+)	1 (-)	4
	Tuber	Tuber, potato, potatoes	14 (+)	2 (-)	3 (-)
	Food	Food, meal, vegetable	4	4	4
Dishes and culinary preparations	Baked	Baked	4	7 (+)	1 (-)
	Pot food	Stew, puchero, pot food	5	9 (+)	3 (-)
	Puree	Puree	3	3	2
	Desserts	Dessert, cakes, SP in syrup	3	2	2
	Dishes	Gnocchi, pie	3	2	1
	Soup	Soup	2	3 (+)	0 (-)
	Salad	Salad	0	0	3 (+)
	Barbacue	Barbacue	2	1	0
	Fried	Fried, chips	0	1	2
Sensory characteristics	Sweet	Sweet, sweetness	4	10 (+)	6
	Violet	Violet, purple	1 (-)	0 (-)	13 (+)
	Color	Color	2	3	4
	Tasty	Tasty, taste, flavor	1	2	2
	Fibrous	Fibrous	1	2	1
	Yellow	Yellow	3 (+)	1	0
	Hard	Hard	2 (+)	0	1
	Barely sweet	Barely sweet, not sweet	2 (+)	0	0
Hedonics	Yummy	Yummy, Delicious	10	16 (+)	8
	Low quality	Low quality, disgusting	3	0 (-)	3
	Quality	Quality, good quality	1	1	0
	Rejection	I wouldn't eat it	2	0	2
Novelty	Different	Different	1 (-)	1 (-)	9 (+)
	Unknown	Unknown, I haven't seen it before	1 (-)	1 (-)	7 (+)
	Novelty	Novel, original	0	0	3 (+)
	Rústico/tradicional	Traditional, rustic	1	1	0
Health and nutrition	Healthiness	Healthy, health	4	3	4
	Carbohydrates	Carbohydrates, starch	3	2	2
	Fiber	Fiber	1	1	1
Naturalness	Natural	Natural, nature	4	2	2
	Artificial	Artificial, genetically modified	0	0	1
Others	Others	Winter, convenient	4	5	2

Note: (+) indicate that the frequency of mention of the category was higher than average, whereas (-) indicate that the frequency of mention of the category was lower than average according to results of the chi-square per cell test for a significance level of 0.05.

3.2 Expected liking and emotional associations

Significant differences in the expected liking of the three types of SP were found ($F_{2,522}=22.0$, $p<0.001$). Orange-fleshed showed the highest average expected liking scores (7.9), in agreement with results from the word association task. Purple SP received the lowest average expected liking score (6.4), whereas *criollo* type received and intermediate average score (7.1).

The three types of SP also differed in their emotional associations. Significant differences were found for 8 of the 21 emoji. The frequency of use of the emoji indicated that the emotional associations raised by the pictures were aligned with their liking. OFSP raised positive emotional associations related to enjoyment and happiness, as evidenced by the higher frequency of use of the smiling face with smiling eyes (😊), smiling face with heart shaped eyes (😍), and smiling face with smiling eyes and open mouth (😄) emojis, compared to the other three types (Table 2). Conversely, purple SP more frequently raised negative or neutral emotional associations related to fear, shame, stress and sadness. As shown in Table 2, this type of SP received the highest frequency of use of the emojis of flushed face (😳), face screaming in fear (😱), grimacing face (😬) and weary face (😩).

Table 2. Percentage of participants who selected the emoji included in the check-all-that-apply question to describe their emotional associations with each of the three types of SP

Emoji	YFSP	OFSP	PFSP
Smiling face with smiling eyes (😊)	43[b]	50[a]	33[b]
Smiling face with heart shaped eyes (😍)	21[b]	31[a]	16[b]
Smiling face with smiling eyes and open mouth (😄)	21[a,b]	27[a]	16[b]
Relieved face (😌)	15[a]	15[a]	9[a]
Face with stuck out tongue (😛)	9[a]	16[a]	9[a]
Winking face (😉)	11[a]	9[a]	11[a]
Neutral face (😐)	12[a]	7[a]	10[a]
Flushed face (😳)	3[b]	1[b]	13[a]
Smirking face (😏)	5[a]	5[a]	7[a]
Smiling face with sunglasses (😎)	4[a,b]	3[a]	8[a]
Grimacing face (😬)	3[a,b]	2[b]	7[a]
Face screaming in fear (😱)	1[b]	2[b]	7[a]
Unamused face (😒)	3[a]	3[a]	4[a]
Face with stuck out tongue and tightly closed eyes (😝)	1[a]	3[a]	4[a]
Angry face (😠)	2[a]	3[a]	3[a]
Confounded face (😖)	2[a]	1[a]	4[a]
Nauseated face (🤢)	1[a]	1[a]	3[a]
Weary face (😩)	0[b]	1[b]	4[a]
Disappointed face (😞)	2[a]	1[a]	1[a]
Crying face (😢)	0[a]	1[a]	1[a]
Face with cold sweat (😓)	0[a]	1[a]	0[a]

Note: Percentages within the same row with different superscript letters are significantly different according to the sign test at a 0.05 significance level

3.3 Expected sensory characteristics

Significant differences between the SP were also found in their expected sensory characteristics. As shown in Table 3, significant differences were found in the frequency of use of 12 of the 17 sensory terms included in the CATA question. OFSP were expected to have typical SP flavor and to be sweet, creamy, soft and moist (Table 3). Meanwhile, *criollo* SP were expected to have typical SP flavor and to be firm, barely sweet and fibrous. The expected

sensory characteristics of purple SP were more similar to *criollo* SP. As shown in Table 3, they were expected to be firm, fibrous, less smooth than OFSP, barely sweet and to have off-flavor.

Table 3. Percentage of participants who selected the sensory terms included in the check-all-that-apply question to describe their emotional associations with each of the three types of SP

Term	YFSP	OFSP	PFSP
Sweet	40[b]	74[a]	43[b]
Tasty	47[a,b]	55[a]	41[b]
Typical sweet potato flavor	58[a]	43[a,b]	35[b]
Firm	38[a]	25[b]	31[a,b]
Smooth	30[a,b]	38[a]	21[b]
Creamy	14[b]	30[a]	14[b]
Barely sweet	27[a]	10[c]	18[b]
Soft	12[b]	22[a]	7[b]
Moist	11[b]	20[a]	8[b]
Fibrous	14[a,b]	8[b]	16[a]
Off-flavor	4[b]	2[b]	17[a]
Tasteless	10[a]	4[a]	6[a]
Dry	7[a]	3[a]	7[a]
Pasty	3[a]	5[a]	5[a]
Not much sweet potato flavor	4[a]	2[a]	6[a]
Rough	2[a]	1[a]	4[a]
Bitter	0[b]	0[b]	4[a]

Note: Percentages within the same row with different superscript letters are significantly different according to the sign test at a 0.05 significance level

4. Discussion

Commercialization data show that supply of YFSP has not decreased in favor of OFSP popularization and that demand for both materials has remained stable around 50:50[7]. This suggests an increase in SP sales and consumption in Uruguay, based on the introduction of a novel orange-colored material. Therefore, the appearance of a new variant, with contrasting texture and flavor together with additional health benefits could be an interesting avenue to promote SP commercialization and consumption. In this context, the present study aimed at exploring Uruguayan consumers' perception of PFSP to gain in-depth insights to inform breeding decisions and the development of marketing strategies to promote its consumption.

As expected, participants were not familiar with PFSP and perceived the purple flesh coloration as a rare feature. This SP raised associations related to beetroot, and scarce positive hedonic and emotional associations related to the emojis flushed face (😳), face screaming in fear (😱), grimacing face (😬) and weary face (😩). Meanwhile, OFSP were mostly associated with sweetness, positive hedonic expectations, and diverse culinary preparations and cooking methods, reaching the highest expected overall liking scores and the most positive emotional associations. Traditional YFSP raised intermediate sensory, hedonic, and emotional associations. This suggests that consumers' expectations were tightly linked with familiarity and previous consumption experiences, stressing the need to develop strategies to increase familiarity with PFSP.

Previous studies have revealed that flavor and texture are the main sensory attributes influencing SP liking[19]. Results from the present work showed that OFSP, the most liked SP, was expected to be sweet, tasty, creamy, soft, humid and with typical SP flavor. Sweetness was one of the main characteristics that differentiated orange coloration from the other two types of SP (74%vs 40-43%), suggesting a strong association of orange with sweetness intensity. On the contrary, YFSP were expected to be firm, barely sweet but tasty, fibrous and with typical SP flavor[19]. Similar results have been reported

when studying the expectations raised by the appearance of SP prior to tasting[22]. Contrastingly, after tasting YFSP INIA Cambará, it was described by Uruguayan consumers as creamy and pasty, being the closest to the ideal[22], revealing a mismatch between the expectations raised by the appearance of YFSP and the actual tasting. In line with this, although Uruguayan consumers positively value orange flesh color, after tasting, the relative importance of flesh coloration decreases and flavor (sweetness and typical flavor) and texture (firmness and creaminess) attributes become the main drivers of overall liking[22].

Regarding PFSP, they were expected to have similar characteristics to YFSP in terms of texture and flavor, being also associated with off-flavors presence. Considering that these characteristics are not valued by Uruguayan consumers[22][25], breeding programs for the selection of new purple flesh genotypes should be focused on increasing sweetness, moist and creaminess. In addition, DM (actually around 35-40%) should be reduced to values more compatible with home-preparation methods such as the ones found in yellow-fleshed types (25-30%) and positively evaluated by consumers[22]. The incorporation of sensory and consumer science as an integral part of the breeding program could contribute to reach materials with acceptable sensory characteristics[25].

Once PFSP materials with acceptable sensory characteristics are obtained, marketing strategies should focus on increasing familiarity. Sensory trials including different preparation methods could provide information regarding appearance, textural and flavor changes after cooking. The promotion of new culinary uses/preparation options (salads or desserts) and education on associated health benefits could help to familiarize with this new product, as it was proposed for popularization of OFSP in Africa[17]. In this sense, emphasis on health-promotion or additional benefits could contribute to the adoption of PFSP by specific consumer segments, since colored materials present higher flavonoids, carotenoids and anthocyanins[2-3][26].

5. Conclusions

Results revealed a lack of consumer familiarity with purple flesh coloration in SP, which led to lower expected liking scores compared to traditional orange and yellow flesh genotypes. This highlights the need to develop diverse marketing strategies to increase familiarity before the commercial release of purple flesh sweet potatoes. Such strategies should emphasize their sensory and hedonic aspects, as well as ideas for how to prepare and consume them. In this sense, tasting sessions in supermarkets and other points of purchase could contribute to increase familiarity and raise positive associations with this new type of SP. In addition, information about the health-benefits of purple flesh could contribute to motivate health-conscious consumers.

Relevant questions remain to be answered regarding the main sensory characteristics that should be present in a new purple-fleshed SP cultivar. It is possible then to speculate that sweetness and moisture content should be closer to those found in OFSP or, at least, similar to the well-valued YFSP, such as INIA Cambará (sweet, creamy, with characteristic SP flavor and 28-30% DM). Breeding through successive hybridation could be used to generate diversity and modify traits traditionally associated with the dominant cultivar in a certain region. The question that remains unanswered is whether this strategy could contribute to segment, diversify and, finally, stimulate SP consumption in Uruguay or not.

Author contribution statement

JL, EV and GA conceived and designed the analysis; GA collected the data and contributed to data analysis; JL and GA wrote the manuscript; EV and GR revised the manuscript; and GR performed experiments to create purple sweet potatoes.

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