

Diversity of Sweet Potato (*Ipomoea batatas* L.) as Food Diversification in Warugunung Village, Pacet Subdistrict, Mojokerto Regency

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Abstract

Sweet potato is a local food commodity rich in nutrients and can be processed into various products to support food diversification in Indonesia. In Warugunung Village, sweet potatoes serve as a source of food and family income that has been passed down for generations. This study aims to identify varieties, compare total carbohydrates between varieties, and analyze public perceptions and apperceptions of sweet potato variety diversity as a means of food diversification. This descriptive study employed a mixed-methods approach, combining qualitative and quantitative methods. Total carbohydrate content was assessed using the by-difference method. Semi-structured interviews were conducted with 40 respondents selected using purposive sampling. The research instruments used an interview guide and a questionnaire. Data on the diversity and total carbohydrate content of sweet potato varieties were analyzed descriptively, while perceptions and apperception were analyzed quantitatively using a Likert scale. The results of the study showed five sweet potato varieties: *Sewu*, *Jago*, *Sawentar*, *Sari*, and *Cangkuang*, which can be distinguished based on their morphological characteristics (leaves and tubers). The Cangkuang variety has the highest total carbohydrate content (33.23% per 100g). The best perception of sweet potato processing into various food products is 96%. The best perception of agricultural efforts in improving the economy and increasing knowledge in sweet potato product processing training activities is 94%. Based on age groups, middle-aged individuals have the best perception of sweet potato processing. This research is expected to contribute to local food diversification strategies and the preservation of sweet potato varieties, which ultimately support food security and family economic well-being.

Keywords: Agricultural practices; Apperception; Crop management; Food security; Perception

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INTRODUCTION

Sweet potato (*Ipomoea batatas* L.), belongs to the Convolvulaceae family, originated in tropical Central America before being introduced to Indonesia around the 16th century (Rukmana, 1997). This plant is renowned for its remarkable adaptability, enabling it to thrive in a wide range of environmental conditions, both in lowland and highland areas (Mustamu et al., 2018; Panjaitan et al., 2019). Indonesia itself ranks as the 13th largest sweet potato producer in the world (FAO, 2022). Furthermore, sweet potatoes exhibit a high degree of varietal diversity, reflected in variations in the morphology of their stems, leaves, and tubers (Laurie et al., 2013; Maitimu et al., 2021). Factors such as genetics, environmental conditions, and the interaction between the two also influence the morphology of this plant (Ngailo et al., 2019; Pérez-Pazos et al., 2021). With its diverse varieties, sweet potatoes offer significant opportunities for the development of plant-based products that can be tailored to consumer preferences, thus contributing to national food diversification strategies.

Sweet potatoes show tremendous potential as a local food ingredient that can be further developed through diversification strategies. As a food crop, sweet potatoes rank sixth in importance globally, after rice, wheat, potatoes, corn, and cassava (Wadl et al., 2018). This crop is renowned for its high adaptability, drought resistance, and the potential for staggered harvests (Mishra et al., 2019; Sapakhova et al., 2023). These characteristics offer advantages in terms of flexibility and income

generation for rural areas, which often face the risk of crop failure (Hendebo et al., 2022). In Indonesia, sweet potatoes frequently serve as a substitute for rice, and in some areas, they even serve as an alternative staple food (Mustamu et al., 2018). Nutritionally, sweet potatoes offer a fairly diverse profile as a food source, although carbohydrates remain their primary component. Most of the carbohydrates in sweet potatoes are in the form of starch, which is composed of two main glucose polymers: amylose and amylopectin. High levels of amylopectin make sweet potato foods easier to digest (Mardalena, 2021). Furthermore, fresh sweet potatoes have a moderate glycemic index, making them highly beneficial for managing blood sugar levels (Ebere et al., 2017).

Warugunung Village, situated in Pacet District, Mojokerto Regency, boasts geographical and climatic conditions that are ideal for cultivating sweet potatoes. This plant thrives in areas with loose soil, adequate rainfall, and moderate temperatures. Observations have shown that residents grow five different varieties of sweet potato, each with its own unique leaf and tuber morphology. Each variety exhibits diverse potential in terms of cultivation techniques, market value, processing methods, and distinctive flavors. For the local community, sweet potatoes play a vital role as a primary food source, animal feed, and a significant source of income. To maintain the sustainability of this crop, they practice sustainable replanting of young stems, alternating with rice and corn, and maintain its economic value through harvest sales and daily use. The development of sweet potato cultivation requires several aspects to achieve sustainable agriculture, such as plant variety selection, natural resource management, and environmentally friendly agricultural strategies (Ansiska et al., 2021).

The knowledge and experience in managing sweet potato diversity that is still possessed by the community have encouraged the formation of perceptions and preconceptions among the people of Warugunung Village. Perception is receiving information through the five senses (Sunaryo, 2004), while preconception interprets thoughts with prior knowledge or experience (Suryadi, 2020). Several studies on sweet potatoes have been conducted in different regions of Indonesia. Uga et al. (2020) in Koya Village, South Tondano District, Minahasa Regency, found that farmers distinguish soil types by colour to produce quality tubers and use rice husks to fertilize the soil and ease harvesting. Maitimu et al. (2021) in Moa Island, Moa Lakor District, West Maluku Regency, reported that some sweet potato varieties are no longer cultivated due to a lack of sweetness, with planting patterns being mixed and intercropped; sweet potatoes there are used for both consumption and animal feed. Leurima et al. (2023) in Wanggar District, Nabire Regency, revealed that sweet potato cultivation remains traditional, passed down through generations, and is used as food, conventional medicine, and natural fertilizer.

Some of these studies have not examined the nutritional value (total carbohydrates) that could support food diversification efforts. Research on sweet potato diversity, cultivation practices, marketing, and processing for food diversification, particularly in Warugunung Village, Pacet District, Mojokerto Regency, has never been conducted. This study aims to identify varieties, analyze comparisons of total carbohydrates between species, and analyze public perceptions and apperceptions of sweet potato variety diversity as food diversification.

MATERIALS AND METHODS

This study was a descriptive study with a qualitative and quantitative approach. This study was conducted from October 2024 to May 2025 in Warugunung Village, Pacet District, Mojokerto Regency (7037'44.77" S 112032'01.20" E) (Figure 1). Morphological variation was examined based on leaves and tubers. Leaf morphological characteristics included general outline, lobe type, number of lobes, lobe centre shape, and immature colour; while tuber characteristics included shape, predominant skin colour, predominant flesh colour, diameter, and length (Laurie et al., 2013; Hayati et al., 2020). These characteristics were described based on the International Potato Center (CIP) (Huaman, 1991); identification of varieties based on references from the Pusat Perpustakaan dan Penyebaran Teknologi Pertanian (2018) and Badan Standardisasi Instrumen Pertanian (2023). Total carbohydrate was measured using the by-difference method, performed twice (duplo) to ensure the accuracy of the results using the following formula, the following formula by FAO (2003):

Total carbohydrate (%) = 100% - (% protein + % fat + % water + % ash + % alcohol) in 100 g

The research target is the community of Warugunung Village, Pacet District, Mojokerto Regency, which was selected using purposive sampling (Fettig et al., 2023). Interviews were conducted in an open and semi-structured manner. Respondents were categorized based on age into four groups: young (17–30 years), adult (31–44 years), middle-aged (45–60 years), and elderly (>60 years) (Indah et al., 2021). The number of respondents was 40 people, including 10 key informants.

The key informants in this study consisted of farm workers, micro, small, and medium enterprises (MSMEs), and housewives who understand the diversity of sweet potato varieties as a food diversification. The research instruments used an interview guide and a questionnaire. This questionnaire consists of 10 questions related to perception and 12 others about apperception, each rated using a five-level Likert scale, ranging from 1 (lowest) to 5 (highest). Data on respondents' perceptions and apperceptions were then analyzed based on percentages, with the formula (1). Percentages were determined based on five categories, namely excellent (81-100%), good (66-80%), simply (51-65%), poor (31-50%), and abysmal ($\leq 30\%$) (Azrianingsih & Kusumahati, 2018).

$$P = \sum_{k=1}^n \frac{x.k}{n.k_{maks}} \times 100\% \quad (1)$$

Note:

P = Value of perception or apperception

x = Number of respondents for the selected answer

k = Answer choice score

n = Total number of respondents

k_{maks} = Highest answer score

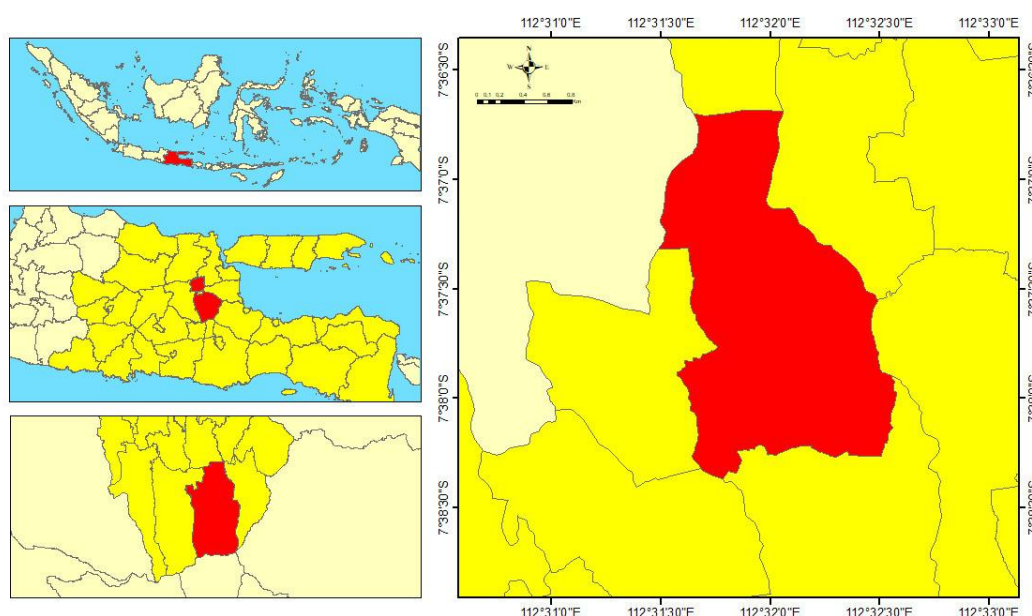


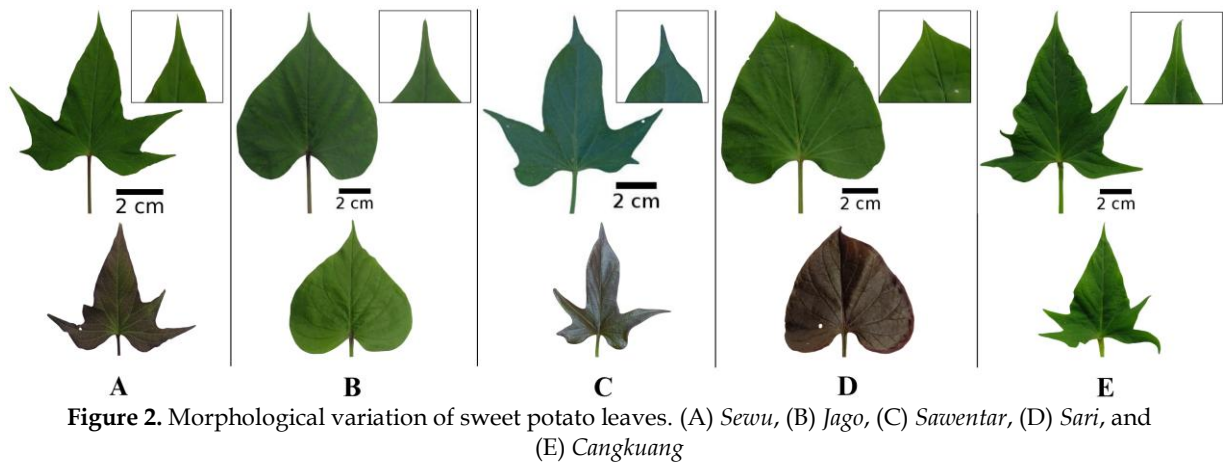
Figure 1. Research the location of the Warugunung Village area (red area)

RESULTS

Based on observations, five sweet potato varieties were identified with various morphological variations in leaves and tubers. Leaf morphological characteristics were examined based on general outline, lobe type, number of lobes, lobe centre shape, and immature leaf colour, as presented in Table 1. The differences between varieties, especially in the general outline (cordate and lobed) and immature leaf colour (green and purple) (Figure 2).

Table 1. Morphological characteristics of leaves from five varieties of sweet potato in Warugunung village

Agricultural Variety Name	Local Name	Variation of Leaf Morphological Characteristics				
		General Outline	Type of Leaf Lobes	Number of Leaf Lobes	Central Lobe Shape	Immature Leaf Colour
Sewu	Orange	Lobed	Moderate	5	Lanceolate	Mostly purple
Jago	Gambas	Cordate	Absent	1	Toothed	Green
Sawentar	Mukid	Lobed	Moderate	5	Semi-elliptic	Mostly purple
Sari	Red skin, white flesh	Cordate	Absent	1	Toothed	Totally purple
Cangkuang	Jengki	Lobed	Moderate	5	Lanceolate	Green



The morphological characteristics of tubers were examined based on shape, predominant skin colour, predominant flesh colour, diameter, and length, (Table 2). The striking differences between varieties, especially in the shape of the tubers, predominant skin colour, and predominant flesh colour (Figure 3). The shape of the tuber varies with each variety from oblong to elliptic. Predominant skin colour has three variations: brownish orange (*Sewu* variety), cream (*Jago* variety), and red (*Sawentar*, *Sari*, and *Cangkuang* varieties). The predominant flesh colour is most striking in *Sewu* variety, which is orange; while *Cangkuang* variety is the palest with a white colour.

Table 2. Morphological characteristics of tubers from five varieties of sweet potato in Warugunung village

Agricultural Variety Name	Local Name	Variation of Tuber Morphological Characteristics				
		Shape	Predominant Skin Colour	Predominant Flesh Colour	Diameter (cm)	Length (cm)
<i>Sewu</i>	Orange	Oblong	Brownish Orange	Intermediate Orange	8-11	15-19
<i>Jago</i>	Gambas	Round	Cream	Cream	10-14	18-23
<i>Sawentar</i>	Mukid	Round-elliptic	Red	Cream	7-11	14-18
<i>Sari</i>	Red skin, white flesh	Obovate	Red	Pale Yellow	5-8	11-17
<i>Cangkuang</i>	Jengki	Elliptic	Red	White	5-7	10-14

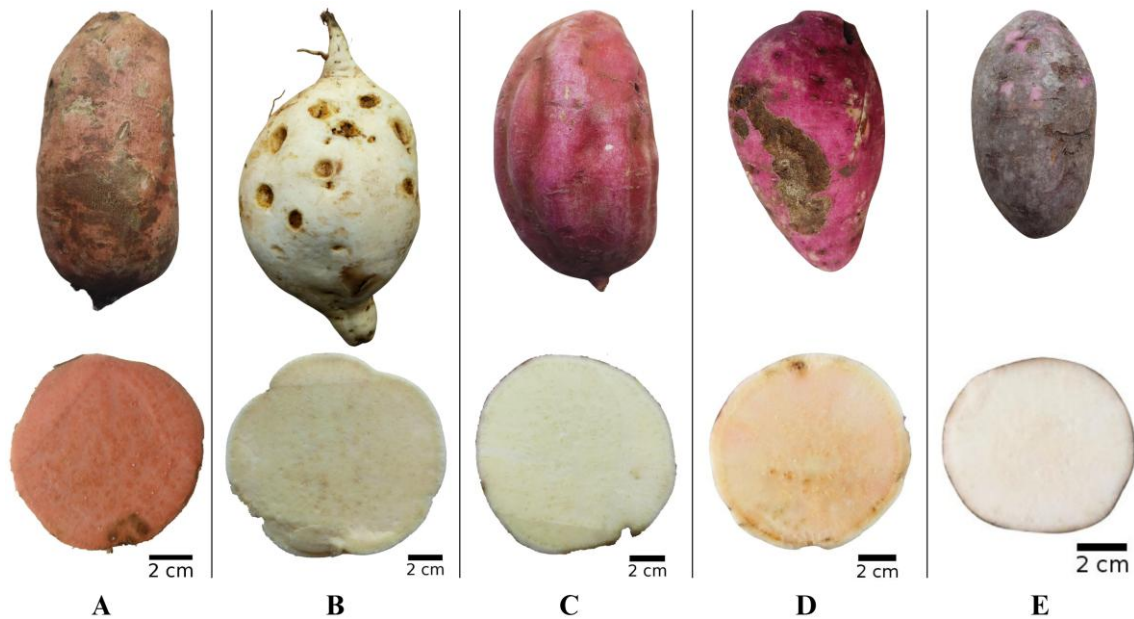


Figure 3. Morphological variation of sweet potato tubers. (A) *Sewu*, (B) *Jago*, (C) *Sawentar*, (D) *Sari*, and (E) *Cangkuang*

Based on the results of tests using the by-difference method, the total carbohydrate content of five sweet potato varieties per 100g showed that the *Cangkuang* variety had the highest total carbohydrate content at 33.23%, followed by *Sari* variety at 31.63%, the *Sewu* variety at 31.07%, the *Jago* variety at 26.53%, and the *Sawentar* variety with the lowest total carbohydrate content at 21.74% (Figure 4).

The respondents for this study were obtained through interviews with 40 people, including 10 key informants. Respondents were grouped into four categories, namely gender, age, highest level of education, and jobs, as presented in Table 3. Most respondents who provided information on their knowledge and experience in sweet potato management were male. Based on age category, middle-aged individuals aged 45–60 years showed the highest percentage as the group capable of providing information on sweet potato management and utilization. Based on the education category, the majority of respondents had completed junior high school, while in the occupation category, most of the respondents were farm workers.

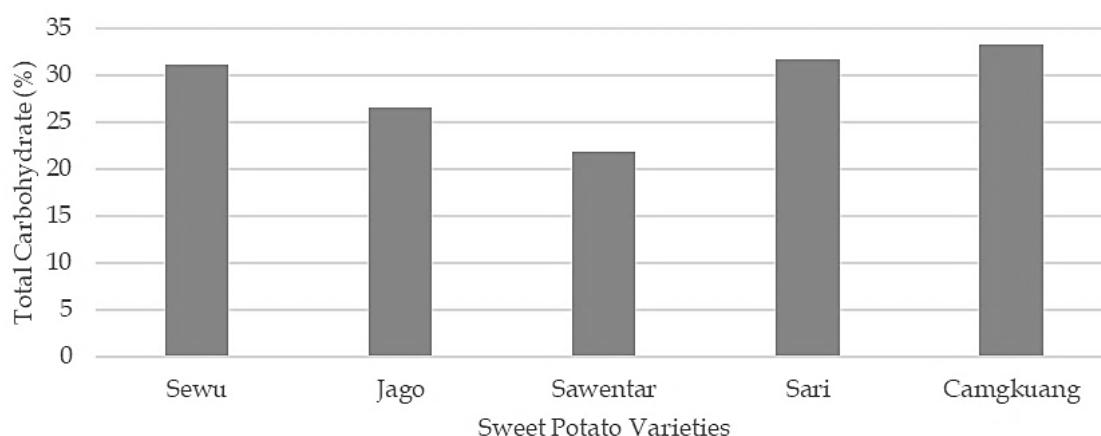


Figure 4. Comparison of total carbohydrate between five sweet potato varieties per 100g

Table 3. Demographic data of research respondents in Warugunung village ($n=40$)

No	Categories	Frequency	Percentage (%)
1	Gender		
	Male	25	62,5
	Female	15	37,5
2	Age (years)		
	Young (17-30)	6	15
	Adult (31-45)	12	30
	Middle-aged (45-60)	17	42,5
	Elderly (>60)	5	12,5
3	Highest level of education		
	Junior High School	24	60
	Senior High School	16	40
4	Jobs		
	Farm workers	21	52,5
	MSMEs actors	3	7,5
	Farm workers and MSME actors	9	22,5
	Housewife	7	17,5

The study's results on the perception of the community in Warugunung Village regarding the diversity of sweet potatoes as food diversification revealed four aspects of perception: role, variety diversity, availability, and processing of sweet potatoes. The data indicate that the community's perception falls into simply to excellent (Table 4). The highest percentage was found in the community's perception of sweet potato processing into various food products, at 96%, while the lowest percentage was found in the community's perception of sweet potato as an alternative food source to replace rice, at 62%.

Young people had the highest percentage of perception in sweet potato processing at 93.3%, while the lowest perception was in the aspect of variety diversity at 66.7%. Adults had the highest percentage of perception in sweet potato processing at 95%, while the lowest perception was in the

aspect of variety diversity at 75.4%. Middle-aged individuals had the highest perception rate for sweet potato processing at 96.5%, while the lowest perception rate was for the role of sweet potatoes at 78.8%. Elderly individuals had the highest perception rate for sweet potato processing at 96%, while the lowest perception rate was for variety diversity at 77% (Figure 5).

Table 4. Data of the perception of the Warugunung village community on sweet potato diversity as food diversification

No	Perception Aspects	Description	Percentage (%)	Category
1	The role of sweet potato	Local food crops	88	Excellent
		Nutritious food source	85	Excellent
		Alternative ingredients to replace rice	62	Simply
2	Sweet potato variety diversity	There are five varieties of sweet potatoes.	65	Simply
		The three most widely cultivated varieties	76	Good
		Local name	78	Good
		Morphological characteristics	91	Excellent
3	Availability of sweet potatoes	Grows easily in various environmental conditions	92	Excellent
		Easy to get	92	Excellent
4	Sweet potato processing	Can be processed into various food products	96	Excellent

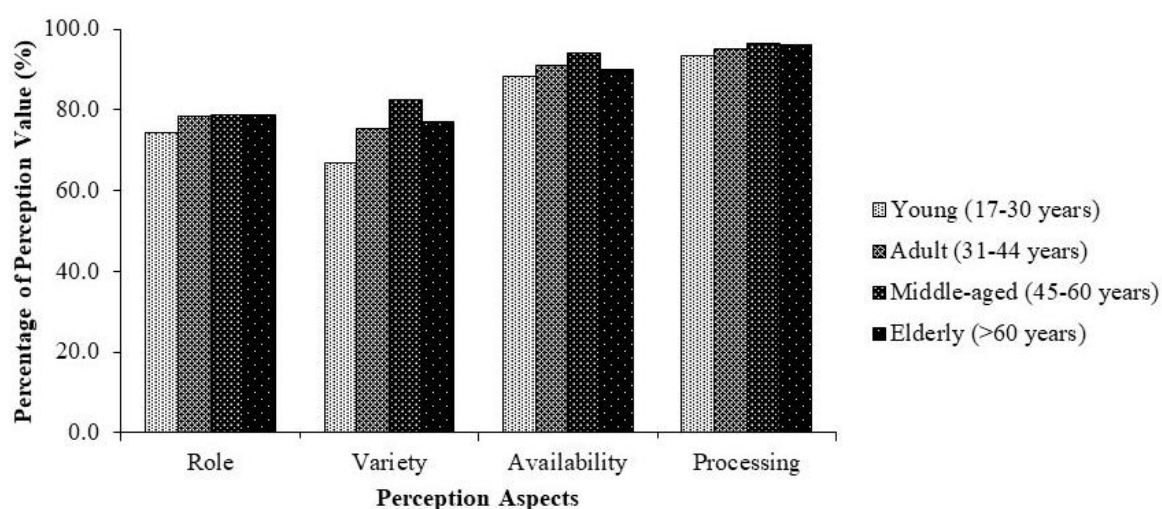


Figure 5. Public perception of sweet potato diversity as food diversification based on age categories

The results of the community perception study on the diversity of sweet potatoes as food diversification revealed five aspects of perception, including consumption, cultivation, potential for economic improvement, conservation, and its role in training activities (Table 5). The highest percentage was found in perceptions regarding farming activities that can help the economy and increase community knowledge in sweet potato processing training activities, at 94%. In contrast, the lowest perception was found in the intensity of community consumption of sweet potatoes, at 34%.

Young people had the highest perception of conservation at 86.7%, while the lowest perception was of the role of sweet potatoes in training activities at 60%. Adults had the highest perception of conservation at 90%, while the lowest perception was of consumption at 71.3%. Middle-aged individuals had the highest awareness of sweet potato's potential in economic development at 93.5%, while the lowest awareness was in the role of sweet potato in training activities at 75.9%. The elderly group had the highest perception of sweet potato's potential in economic development and conservation at 88%, while the lowest perception was in the role of sweet potato in training activities at 68% (Figure 6).

Table 5. Data of the apperception of the Warugunung village community on sweet potato diversity as food diversification

No	Apperception Aspects	Description	Percentage (%)	Category
1	Sweet potato consumption	Intensity of sweet potato consumption	34	Poor
		Consuming sweet potatoes as a snack	93	Excellent
		Simple processing methods	89	Excellent

No	Apperception Aspects	Description	Percentage (%)	Category
2	Sweet potato cultivation	Differences in processing methods for each variety	70	Good
		Sweet potato planting pattern is monoculture	79	Good
		Planting material comes from previous harvests and fellow farmers	81	Excellent
		Selection of superior varieties	89	Excellent
3	The potential of sweet potatoes in improving the economy	Farming helps the community's economy	94	Excellent
		Differences in market segmentation for each variety	80	Good
4	Conservation measures	Conservation through management and utilization	91	Excellent
5	The role of sweet potatoes in training activities	Community participation in training on processed product manufacturing	50	Poor
		Improvement of community knowledge in training activities	94	Excellent

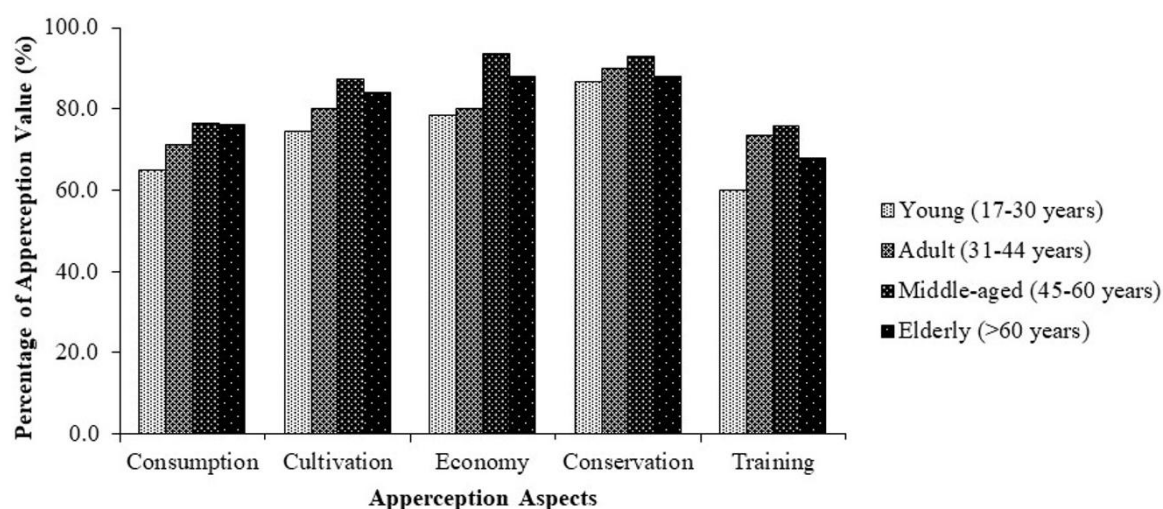


Figure 6. Public apperception of sweet potato diversity as food diversification based on age categories

DISCUSSION

Based on the study's results, five varieties of sweet potato were identified in Warugunung Village, Pacet District, Mojokerto Regency, which can be distinguished based on the morphological characteristics of the leaves and tubers. According to Maitimu et al. (2021), leaf and tuber morphology variations influence sweet potatoes' high diversity. Cordate leaves can perform photosynthesis more effectively than lobed leaves (Sinon et al., 2025). According to Kristianto et al. (2024), a general leaf outline is the main characteristic in identifying local varieties because it is most clearly visible. The purple colour is caused by the accumulation of anthocyanins, especially cyanidin and peonidin derivatives (Li et al., 2019). Anthocyanins are water-soluble flavonoid pigments that give red, blue, and purple colours to plant organs such as roots, stems, leaves, flowers, and fruits (Saati et al., 2019). The colour of immature leaves can be used as a primary distinguishing characteristic between one variety and another (Rahajeng et al., 2023).

There are five variations in tuber shape, plays a crucial role in industrial processing, influencing quality and processing efficiency (Neilson et al., 2021; Park et al., 2024). According to Fan et al. (2022), tuber shape can be considered the primary target in breeding programs to improve shape and eye depth uniformity. Uniform tuber shape has evenly distributed eyes and shallow eye depth, facilitating peeling and reducing waste. Tuber flesh colour indicates potential as an industrial raw material (Waluyo et al., 2013). Orange tuber flesh is caused by β -carotene compounds with high vitamin A content (Woolfe, 1992; Ginting et al., 2013). White and yellow tuber flesh contains low moisture content (Ginting et al., 2008). The varieties with the largest tuber length and diameter are Jago, measuring 18–23 cm and 10–14 cm, while the smallest tuber length and diameter are found in Cangkuang, measuring 10–14 cm and 5–7 cm. Genetic factors influence tuber length and diameter more significantly than the environment (Dewi et al., 2019). Genetic factors greatly influence sweet potato yield variation in different growing environments (Maulana et al., 2022). According to

Purbasari & Sumadji (2018), general leaf outline, immature leaf colour, tuber predominant skin colour, and tuber predominant flesh colour are not influenced by environmental factors.

Based on Figure 4, *Cangkuang* variety has the highest total carbohydrate, while *Sawentar* variety has the lowest total carbohydrate. Sweet potato varieties with the highest total carbohydrate are suitable for everyday use as a food source. According to Ruziev et al. (2024), the highest carbohydrate content indicates a rich energy source, thus having potential in food diversification efforts. The *Cangkuang* variety (white predominant flesh colour) has a higher total carbohydrate than the *Sewu* variety (orange predominant flesh colour). These results are consistent with those of Bao & Fweja (2020) in Tanzania and Ayeleso et al. (2024) in South Africa, who discovered that sweet potatoes with white flesh often contain more total carbohydrates than those with orange flesh. According to Guo et al. (2019), total carbohydrate content seems irrelevant to tuber form, particularly the primary flesh color, as the plant's genetic composition mainly determines it. In terms of growth cycles, *Cangkuang* frequently requires 16 weeks or more to reach harvest, whilst *Jago* and *Sawentar* types typically mature around 12 weeks. Crop total carbs at 12 weeks of maturity range from 10.52% to 25.46%, while those at 16 weeks range from 13.32% to 30.07%, according to Ndah and Ojamelukwe (2019). The testing strategy itself may influence these outcomes; in this instance, the study used the by-difference technique. Elevated quantities of other nutrients, such as proteins, lipids, water, and ash, usually result in lower measured carbohydrate totals (Samhana and Indrasti, 2024).

Based the total respondents in Table 3, males dominate, especially among key informants. The high number of male respondents indicates their role in sweet potato cultivation. Male play a role in land preparation, planting, maintenance, and harvesting; while female play a role in processing sweet potatoes into various processed foods and marketing them. This is similar to Guiriba's (2019) study, where male play a major role in sweet potato cultivation especially in heavy work in the fields, such as plowing the fields, making mounds, collecting planting materials, and planting crops; while female are responsible for light and easy work, such as processing, utilization, and marketing. Therefore, female do not have specialized knowledge in sweet potato cultivation. In contrast to the study by Munyuli et al. (2022), female constitute the majority of respondents in sweet potato cultivation as they are involved in several jobs, such as cutting vines, planting, and collecting tubers for storage.

Based on Table 4, the public's perception of the role of sweet potatoes as a local food crop ranges from simply (62%) to excellent (88%). The public agrees with this because sweet potatoes have been cultivated and used in daily life for a long time. Sweet potatoes also have a rich nutritional content, making them capable of meeting a family's dietary needs. This nutritional content includes much dry matter, primarily carbohydrates (Woolfe, 1992). The high carbohydrate content makes sweet potatoes an alternative to rice. This is contradictory to consumption practices in the community. Most people consider rice the main food because rice is the highest commodity in the village. Therefore, efforts to increase awareness and education on the nutritional benefits of sweet potatoes as part of a food diversification strategy are needed.

Public perception of sweet potato variety diversity ranges from simply (65%) to excellent (92%). The *Sewu*, *Jago*, and *Sawentar* are the most well-known and widely cultivated varieties. Most of the community and farmers are unfamiliar with the *Sari* and *Cangkuang* varieties. This is because these varieties are new and are only grown on a plot of land in Wonokerto Hamlet. According to Adejuwon et al. (2019), new varieties must be introduced to farmers as they have proven better than older varieties. Introducing new varieties can be done through informal channels, such as family and traders, emphasizing their nutritional value for all consumers (Brouwer, 2021). Sweet potato varieties are named based on the predominant skin and flesh colour of the tuber (orange), the shape of the tuber (*Gambas*), and the name of the field owner or farmer (*Mukid*). The origins of the *Gambas*, *Mukid*, and *Jengki* varieties are unknown because they originate from other regions. However, according to local farmers, the name "*gambas*" refers to the shape of the tuber when it is mature, with the nickname "*gembos*," meaning "shriveled" or "slender." Local communities recognize the names of sweet potato varieties based on tuber morphological characteristics, particularly shape and predominant skin and flesh color. In addition to the tubers, farmers can identify local variety names based on leaf morphological characteristics, such as the general outline and immature colour of leaves. According to Ranasingh et al. (2024), leaf and tuber characteristics, such as diameter, are easily recognizable. Research by Wattimena et al. (2022) also revealed that the color and shape of leaves and tubers can be distinguished, making these characteristics easily identifiable by the community.

The public's perception of sweet potatoes' potential as a raw material for processed products is excellent (96%). Sweet potatoes can be developed into four product groups: fresh products, ready-

to-eat products, ready-to-cook products, and semi-finished products (Widowati, 2011). Public perception of sweet potato diversity as food diversification based on age categories shows that the middle-aged group (45-60 years) has the highest average perception score in all four aspects of perception: role, variety diversity, availability, and processing of sweet potatoes. This is in line with the research by Olorunfemi et al. (2023), which states that middle-aged individuals nearing old age have a high knowledge of sweet potatoes, particularly orange sweet potatoes.

Based on Table 5, public apperception of sweet potato consumption ranges from poor (34%) to excellent (93%). People rarely consume sweet potatoes because they adjust their consumption to the harvest time, and not all harvests are consumed. Most people consume them as snacks or side dishes. Various processed sweet potato products commonly consumed by the community include boiled sweet potatoes, steamed sweet potatoes, fried sweet potatoes, gethuk, pilus, or timus, and others. These food products, such as boiling, steaming, frying, and baking, are still processed traditionally and straightforwardly. Based on the knowledge and experience of the community, the Jago variety is suitable for frying, while the sewu and sawentar varieties are suitable for boiling or steaming. The white, yellow, and purple flesh colors of sweet potatoes indicate lower water content and a softer texture, making them ideal for boiling, unlike orange flesh (Ginting et al., 2008).

Monoculture sweet potato cultivation is used as a cropping pattern to ensure the growth and development of sweet potato plants are not outcompeted by other crops. This pattern provides a good income for small- and medium-scale farmers, and this pattern is adapted for production (Valverde et al., 2020); Abrham et al., 2021). The risk of increased pest and disease attacks is increased by the long-term use of monoculture cropping patterns (Xiang et al., 2021). Farmers also reported this, stating that pests and diseases often attack sweet potato plants, such as root attacks by weevils and leafhoppers. Natural biopesticides from various flora are used to control pests, because these biopesticides contain active compounds with insecticidal properties (Yuliani & Lisdiana, 2013). Sweet potato planting material is obtained from the previous harvest, which is stored and shared among fellow farmers in the village and other villages. This has been practiced for generations since the time of the ancestors. According to Munyuli et al. (2022), planting material obtained from neighbours or fellow farmers can be beneficial because farmers can choose the desired variety for a specific location. The selection of superior varieties is based on several aspects, such as market or consumer demand, ease of maintenance during cultivation, and good harvest yields in large quantities. According to Adejuwon et al. (2019) and Munyuli et al. (2022), sweet potato varieties are selected based on nutritional value, skin color, flesh color, taste (consumer preference), size, personal preference, market value, demand, maturity period of 3-6 months, high yield, storage life, and resistance to pests and diseases.

Public apperception of the potential of sweet potatoes to improve the economy ranges from good (80%) to excellent (94%). Sweet potatoes play a crucial role in the economy, not only as fresh tubers but also as raw materials for various value added products. Each variety has different market segments in terms of marketing. For example, the *Sewu* variety is more frequently used by processing industries, such as for chips and jams;. In contrast, in local markets or through wholesalers, the *Jago* and *Sawentar* varieties are generally sold. Orange-fleshed sweet potatoes are rich in carotenoids, and their taste is preferred by consumers, making them a good source of vitamin A and a valuable ingredient in various food products (Neela & Fanta, 2019). Chips are one example of a food product whose carotenoid and resistant starch content can be enhanced through frying, thus increasing consumer appeal and purchasing interest (dos Santos et al., 2021). Cultivation practices based on agricultural practices contribute significantly to the local economy. This is supported by Guiriba (2019), who stated that food production and security can be improved through farmer practices. Agricultural practices implemented by local farmers include maintaining productive local varieties, such as those with a relatively short harvest period of 3-3.5 months (*Jago* and *Sawentar*), as well as varieties favored by the industry (*Sewu*). Small-scale farmers' incomes can be increased by agricultural practices such as the use of superior sweet potato varieties, the adoption of new varieties, and the implementation of phased planting techniques (Mustacisa-Lacaba et al., 2023).

Community perception of sweet potato conservation was rated as excellent (91%). This reflects the community's active practice of crop rotation and daily use of sweet potatoes. Other commodities, such as rice and corn, are used in crop rotation. Rice and sweet potato yields can be increased by crop rotation with rice, land use benefits can be improved, and the availability of sweet potato planting material can be increased (Kyalo et al., 2024). Productivity can be reduced by up to 50% by crop rotation with corn due to the presence of allelopathic compounds that inhibit subsequent plant growth (Harnowo & Utomo, 2020).

The community's apperception of sweet potato-based product training ranged from poor (50%) to excellent (94%). In this case, the low level of community participation indicates that access to information and community involvement in training activities are not evenly distributed. This may be due to several factors, such as differences in interest between men and women, or a lack of socialization by the training organizers. Most male respondents in this study focused more on cultivation and marketing, while processing training was more popular among women. However, the training activity conducted in this village was "Training in Making Chocolate Sweet Potato Chips." Nevertheless, most of the community recognized that the training could enhance their knowledge and experience in making sweet potato-based processed products.

Public perception of sweet potato diversity as food diversification based on age categories shows that middle-aged people (45–60 years) have the highest average perception scores in all five aspects of perception, namely consumption, cultivation, potential for economic improvement, conservation, and the role of sweet potatoes in training activities (Figure 4.5). This indicates that the middle-aged group has broader experience and higher involvement in sweet potato cultivation and utilization. Individuals over 30 years old, with an average age of 53 years, have extensive experience in sweet potato cultivation (Hamidah et al., 2024).

CONCLUSION

Research shows that there are five varieties of sweet potato in Warugunung, namely *Sewu*, *Jago*, *Sawentar*, *Sari*, and *Cangkuang*, which are distinguished based on leaf and tuber morphology. The *Cangkuang* variety has the highest total carbohydrate, while the *Sawentar* variety has the lowest. The public perception of sweet potato processing in various products is excellent, but as a rice substitute, it is only sufficient, and regular consumption remains poor. Public apperception of farming efforts and sweet potato processing training is excellent, with the highest response from the 45–60 age group. Local sweet potato-based food diversification has great potential to improve food security and the economy of rural households, especially if supported by the active participation of productive age groups in food processing training.

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CONFLICT OF INTEREST

There is no conflict of interest.

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