

Changes in the Sensory Characteristics of Mango Cultivars during processing into Mango Purée and Sorbet.

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- Studies have shown perceptible differences in fresh mango flavor and texture among cultivars, but little work has examined the sensory effects of processing on cultivars of fresh fruits and vegetables.
- Studying the transformation that mango cultivars undergo throughout production could help manufacturers select appropriate mango varieties.
- The object of the study was to compare the flavor and texture properties among mango cultivars as they are processed from fresh mango to mango purée (intermediary product) to mango sorbet (finished product).

Materials and Methods

- Descriptive sensory analysis was performed to determine the differences of the four mango cultivars; Haden, Kent, Manila, and Tommy Atkins. They were served fresh, puréed, and as sorbet.



Terms used in evaluating fresh mango, mango purée, and mango sorbet

Mango Identity	Chemical	Woody	Pulpy Residue
Fruity	Cumin	Overall Sweet	Cohesiveness of Mass*
Grapefruit	Green	Overall Sour	Particles*
Orange	Green-viney	Sweet	Firmness*
Peach	Fermented	Bitter	Thickness**
Pineapple	Floral/Perfumy	Sour	Mealy**
Cooked‡	Musty	Metallic	Viscosity‡
Animalic	Peel-like	Astringent	Mouthcoating‡
Black Pepper	Piney	Chalky Mouthfeel	Density†
Caramelized	Spicy	Slimy	Meltdown†
Clove	Starchy	Slickness	Iciness†
	Vegetable	Fiber Awareness	

*Only applies to fresh mango. **Only applies to mango purée. †Only applies to mango sorbet. ‡Only applies to mango purée and sorbet

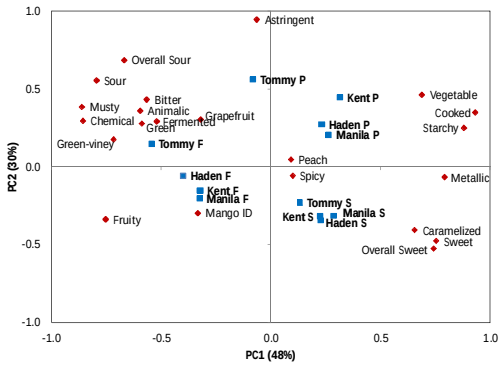
Results

Mean scores of texture attributes for 4 cultivars in the form of fresh mango, mango purée, and mango sorbet

	Fresh				Purée				Sorbet			
Attribute	Haden	Kent	Manila	Tommy	Haden	Kent	Manila	Tommy	Haden	Kent	Manila	Tommy
Chalky Mouthfeel	2.9^{ab}	3.3^{a}	3.2^{a}	3.5^{a}	2.3^{abcd}	1.1^{d}	1.7^{bcd}	1.4^{cd}	2.9^{ab}	2.6^{abc}	2.6^{abc}	2.4^{abcd}
Slimy	8.9^{ab}	10.3^{a}	9.2^{ab}	9.4^{ab}	6.8^{bc}	4.5^{c}	6.2^{bc}	4.8^{c}	6.4^{bc}	6.4^{bc}	6.5^{bc}	6.5^{bc}
Slickness^{ns}	6.7	7.3	6.7	6.2	6.4	6.7	6.2	6.8	6.6	7.0	6.7	7.1
Fiber Awareness	5.4^{a}	3.1^{b}	2.9^{b}	5.7^{a}	1.0^{c}	0.2^{c}	0.4^{c}	0.3^{c}	0.1^{c}	0.1^{c}	0.3^{c}	0.4^{c}
Pulpy Resid	2.5^{a}	2.4^{ab}	2.5^{a}	2.3^{abc}	1.9^{abc}	1.3^{bcd}	1.3^{cd}	1.6^{abcd}	0.6^{d}	0.7^{d}	0.9^{d}	0.7^{d}
Cohesivness of Mass^{ns}	5.0	4.8	4.9	5.4	-	-	-	-	-	-	-	-
Particles^{ns}	1.1	0.6	0.8	1.4	-	-	-	-	-	-	-	-
Firmness^{ns}	10.5	10.6	11.2	12.1	-	-	-	-	8.3	8.3	8.3	8.8
Thickness^{ns}	-	-	-	-	6.0	2.8	4.9	3.1	-	-	-	-
Mealy^{ns}	-	-	-	-	4.7	6.1	3.6	5.8	-	-	-	-
Viscosity^{ns}	-	-	-	-	8.6	6.9	7.4	7.1	4.5	4.7	4.6	4.3
Mouthcoat^{ns}	-	-	-	-	5.3	4.8	5.1	4.8	6.1	5.7	6.2	5.6
Density^{ns}	-	-	-	-	-	-	-	-	7.7	7.2	7.8	7.4
Meltdown^{ns}	-	-	-	-	-	-	-	-	6.4	6.0	6.4	6.1
Iciness^{ns}	-	-	-	-	-	-	-	-	2.6	1.6	2.0	1.9

^{ns}Not Significant ($P \geq 0.05$).
Means with different superscripts within a row are significantly different ($P < 0.05$). For the attributes firmness, viscosity, and mouthcoating ANOVA was conducted to compare means across cultivars separately for each sample type (fresh, purée, and sorbet). For all other attributes ANOVA was conducted to compare means across all samples. Dashes indicate that attributes were not evaluated.

PCA biplot illustrating the relationships among the fresh mango, mango purée, and mango sorbet samples (■) for the 4 cultivars based on descriptive flavor attributes (◆).



ANOVA are not shown

Conclusions

- Many of the flavor distinctions among mango cultivars carried over from fresh mangoes to mango purées.
- Processing fresh mangoes into mango purée generally decreased fruity character and mango identity and led to the appearance of a cooked note.
- Much of the texture variation among cultivars was lost after fresh samples were transformed into purée.
- Processing purée into sorbet minimized flavor variation among cultivars and sorbets were characterized more by their sweetness.
- Results from the study suggest that because the flavor of mango cultivars change during the processing (textural changes during processing to purée and flavor changes during further processing to sorbet) manufactures should select cultivars based on mango properties after thermal and other processing treatments.
- To assist in selecting cultivars for mango purée and sorbet production consumer studies should be conducted to determine which attributes influence most influence acceptance of finished mango products.

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