

Sizes of Currently Available Produce May Significantly Affect Nutrient Intake Assessment.

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Introduction:

Nutrient databases are essential tools in:

Clinical research

Dietary guidance

Food labeling

Epidemiology

Nutritional Status

Risk Factors.



CNA Uses

- Research
 - Clinical
 - Epidemiology
- Nutrition Education
- Public Health Recommendations
- Menu Planning
- Diet Planning
- Popular Media
- Recipes
 - Cookbooks
 - Food Columns
- Culinary
 - Restaurants
 - Food Labeling
 - Purchasing



Objective:

To determine if advances in agricultural practice (i.e. changes in produce weights) may lead to significant errors in the estimation of nutrient intake and other computer nutrient analysis (CNA) applications.



Methods and Materials:

- 5 major supermarkets in Honolulu
- Subset of most commonly consumed fruits and vegetables in the U.S.
- the largest
- the smallest
- 1 to 3 median-sized
- Weights were measured and compared to USDA SR16-1 database.



Example of Sampling Technique - Tomatoes



Results:

Small ---Honolulu to USDA SR16-1

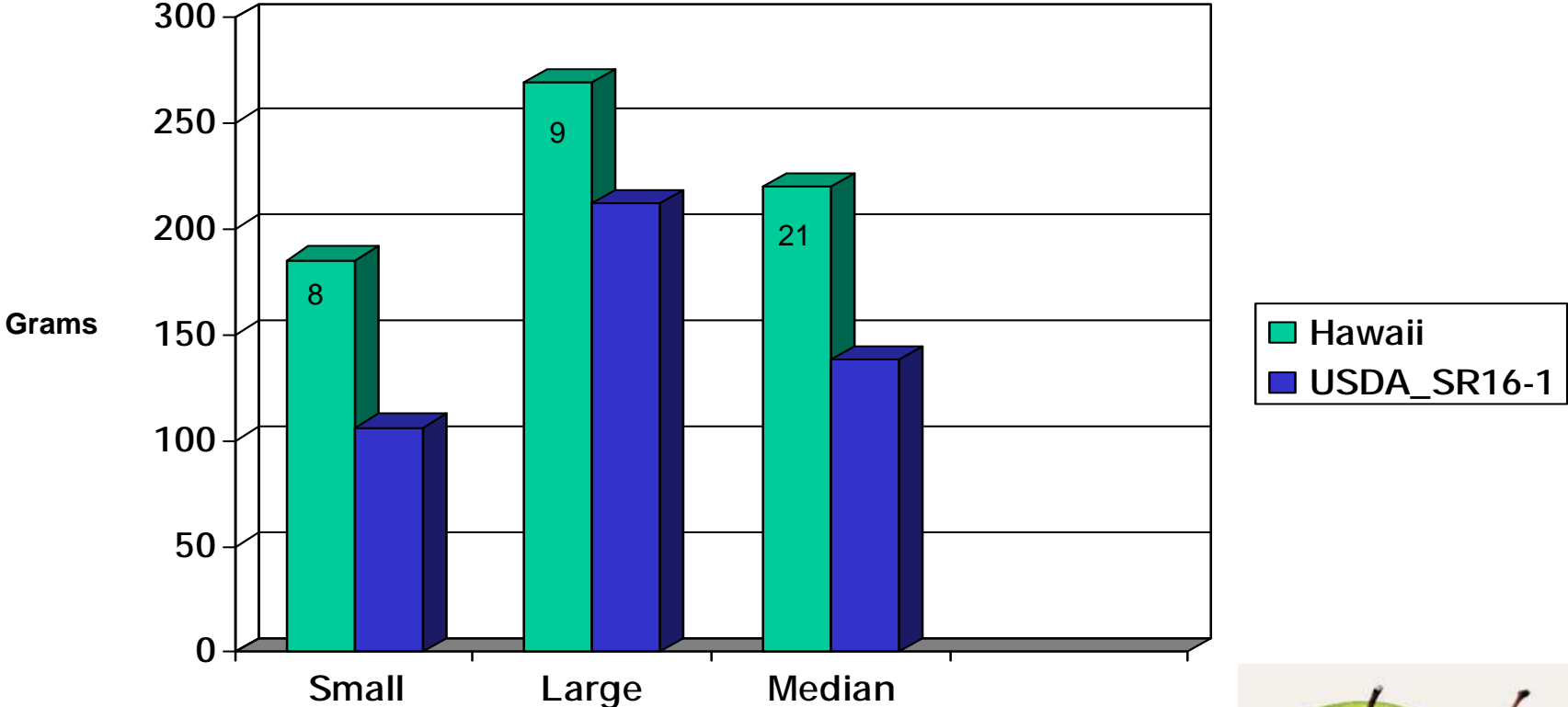
Large ---Honolulu to USDA SR16-1

Median ---Honolulu to Medium USDA SR16-1

Comparisons of Energy Content Differences



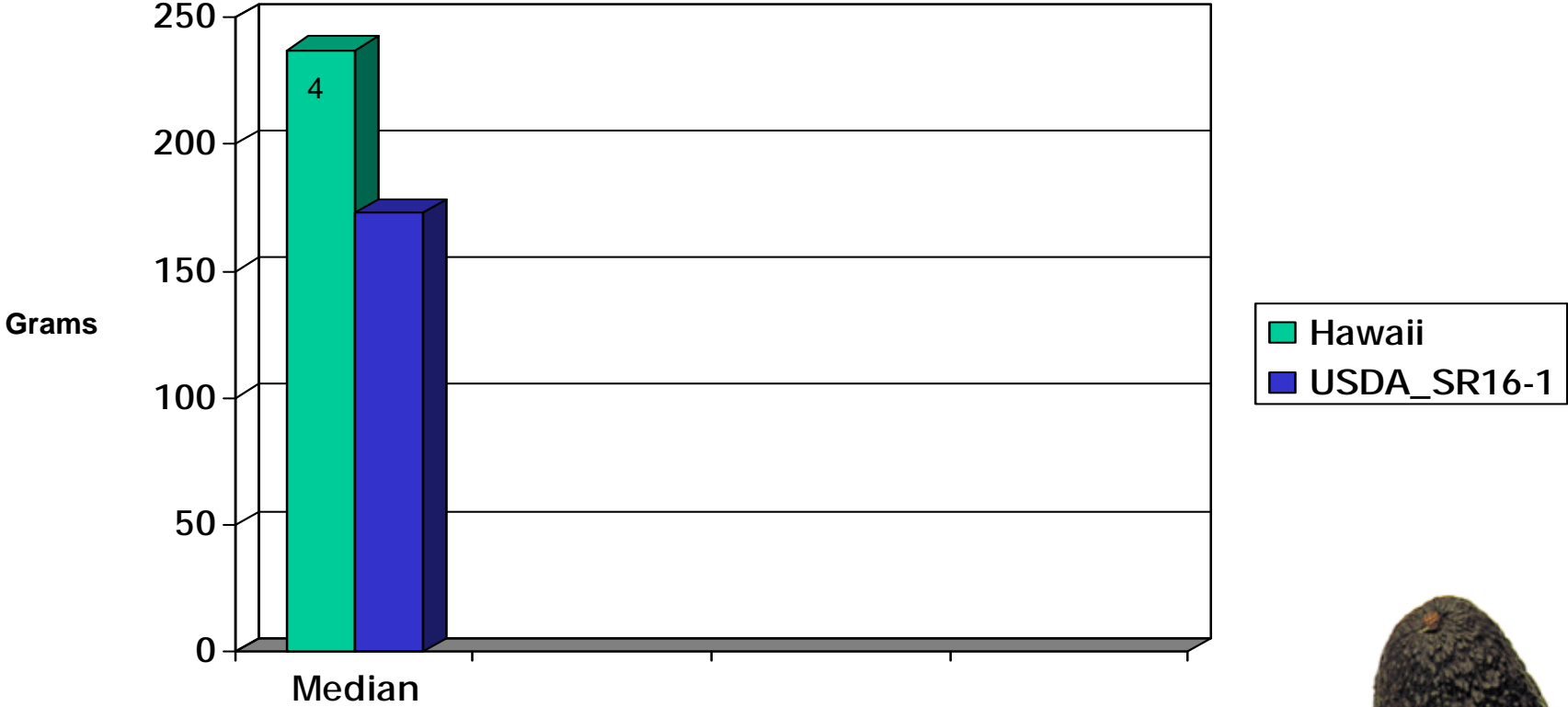
Edible Portion Comparisons of Hawaii Store-bought versus USDA-SR16-1 Database



Apples
(multiple varieties)



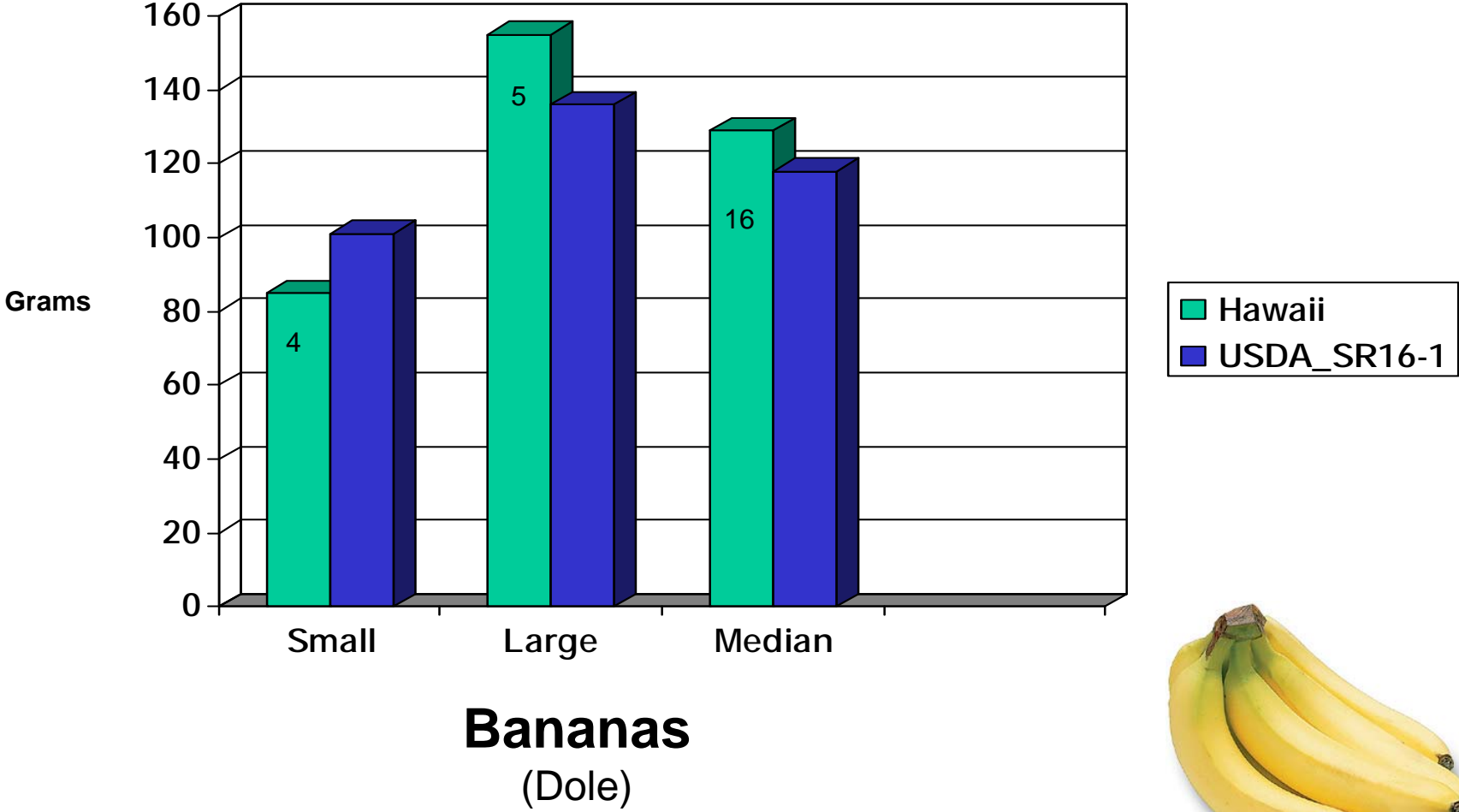
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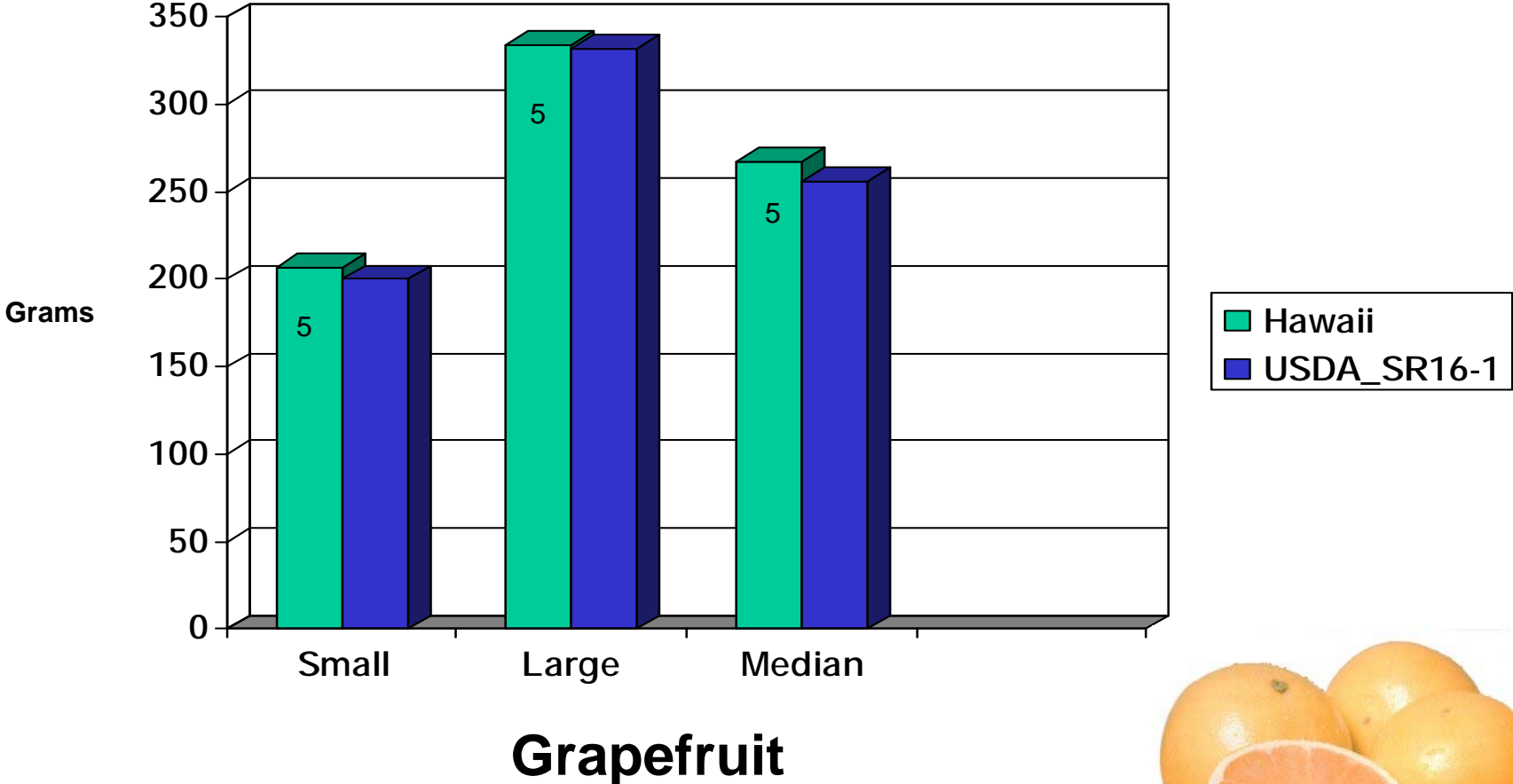
Avocados
(Haas variety)



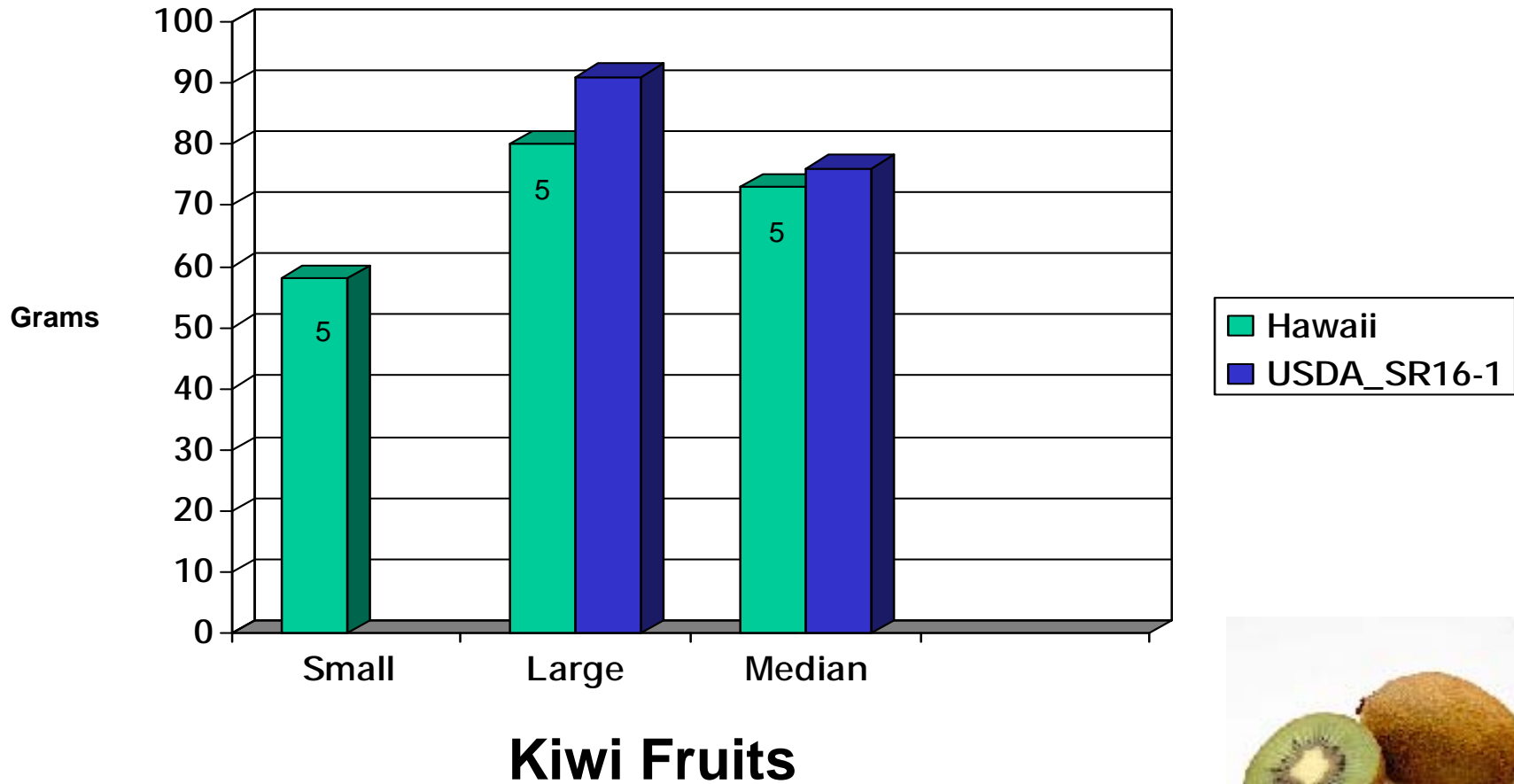
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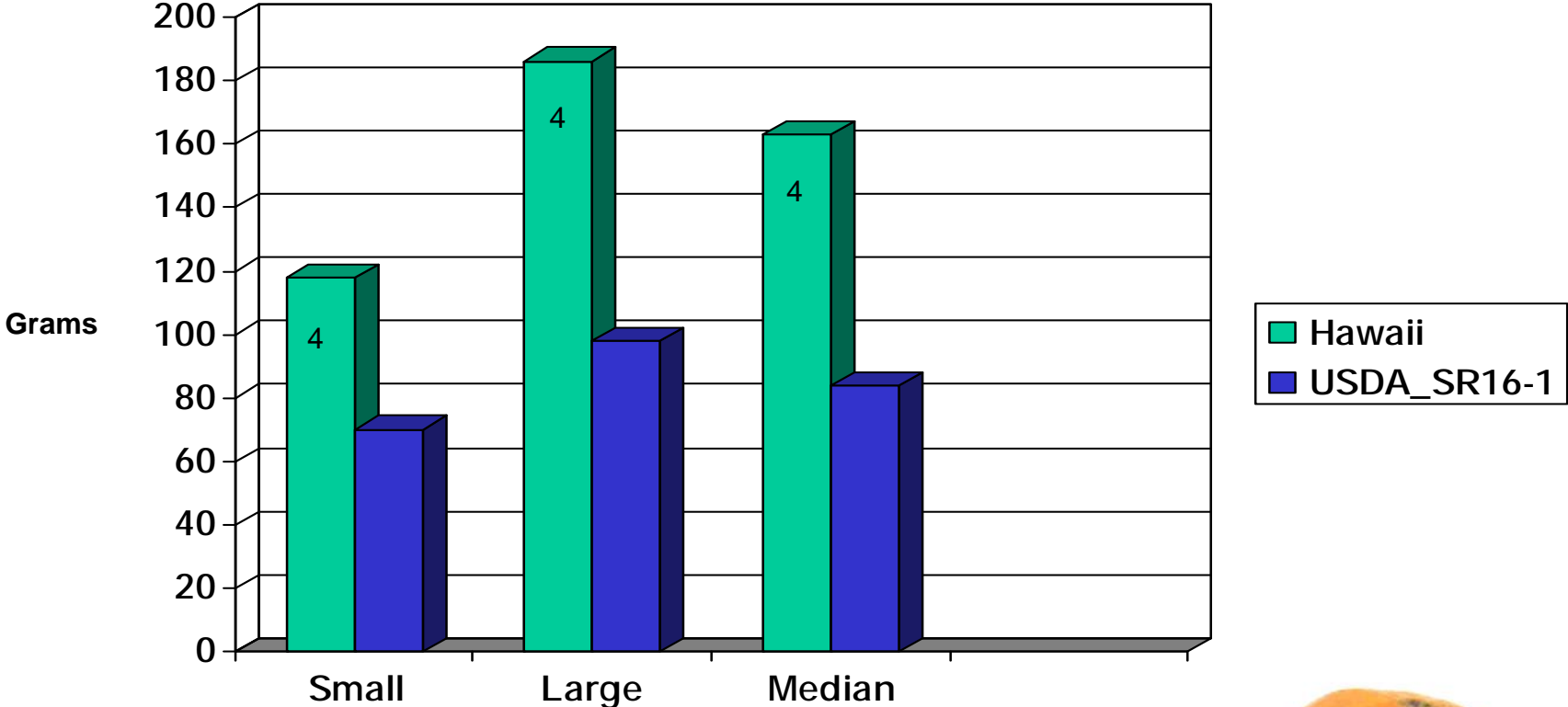
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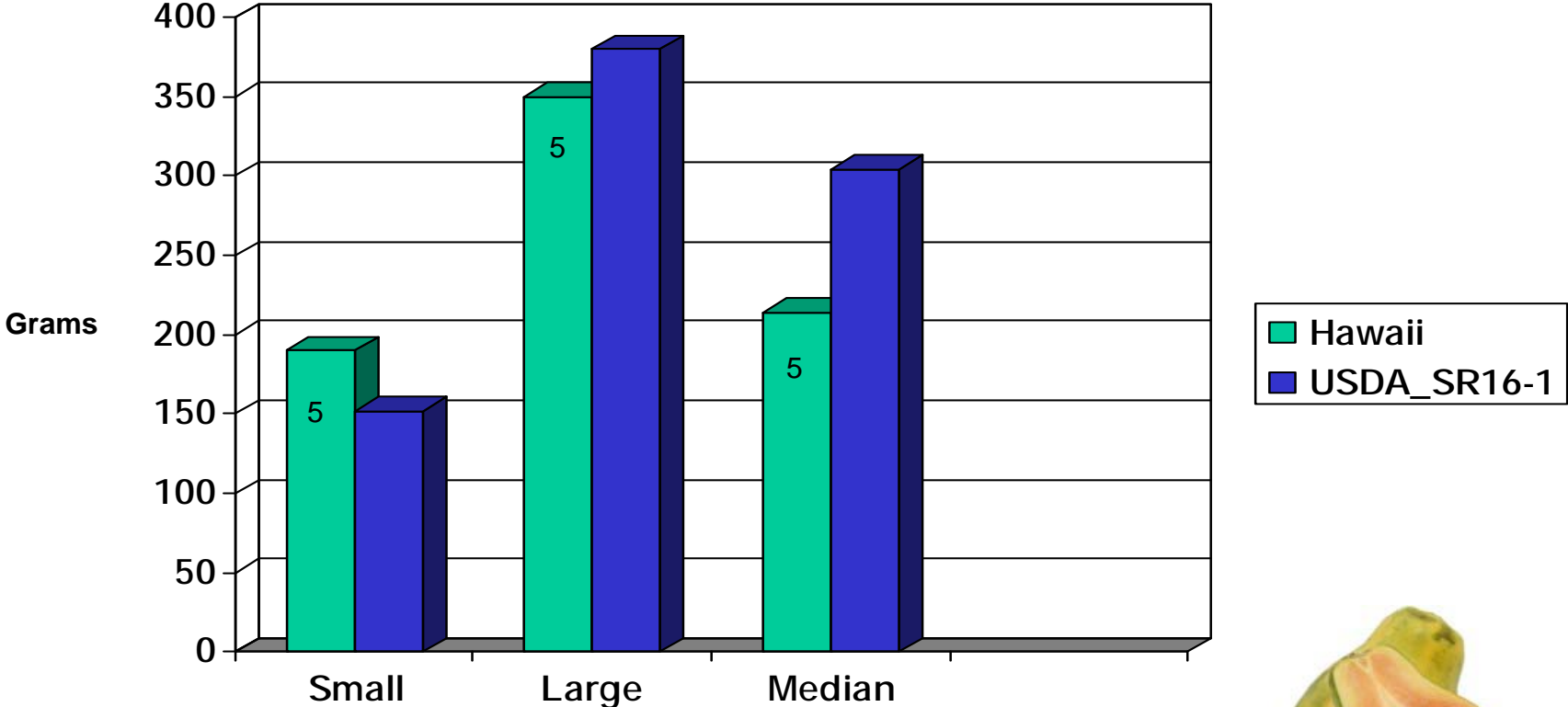
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Tangerine



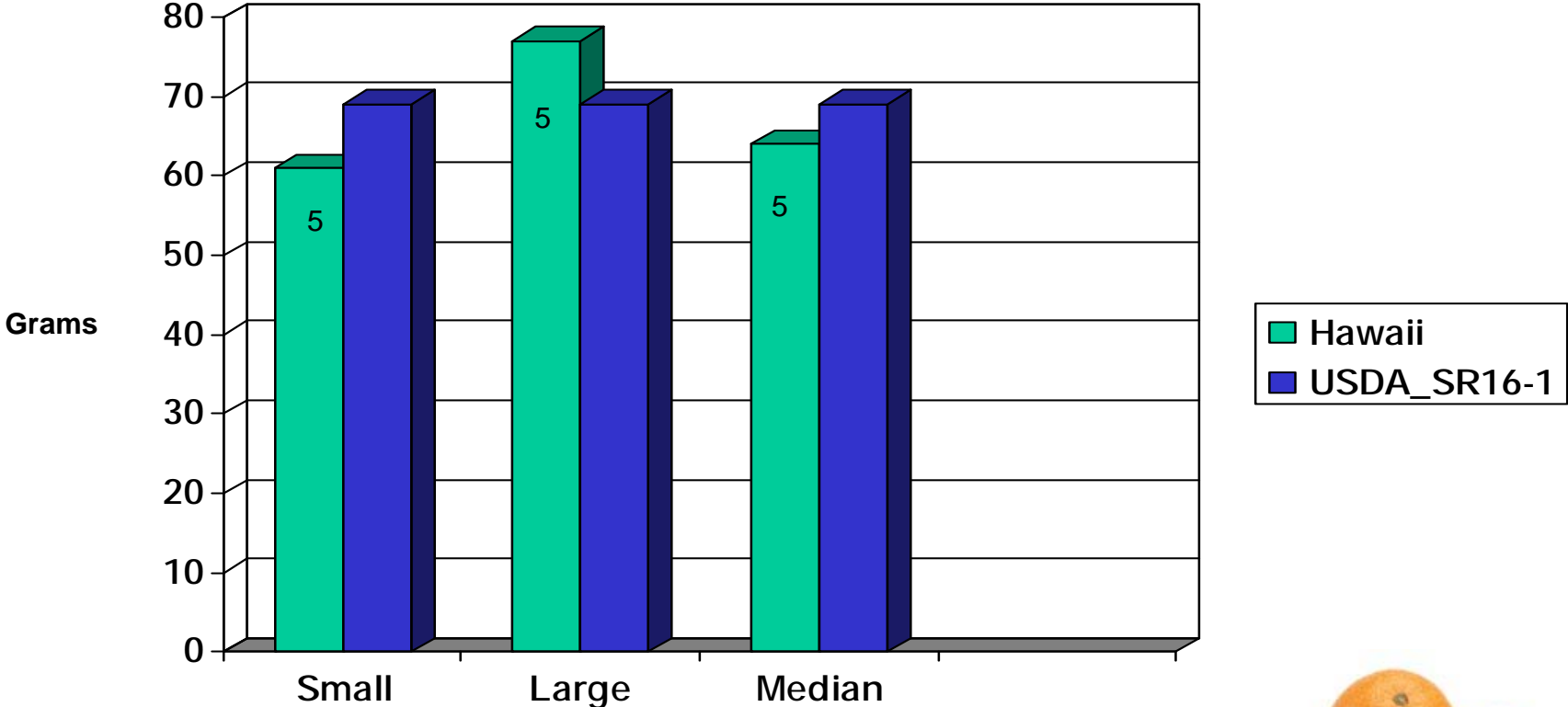
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Papayas



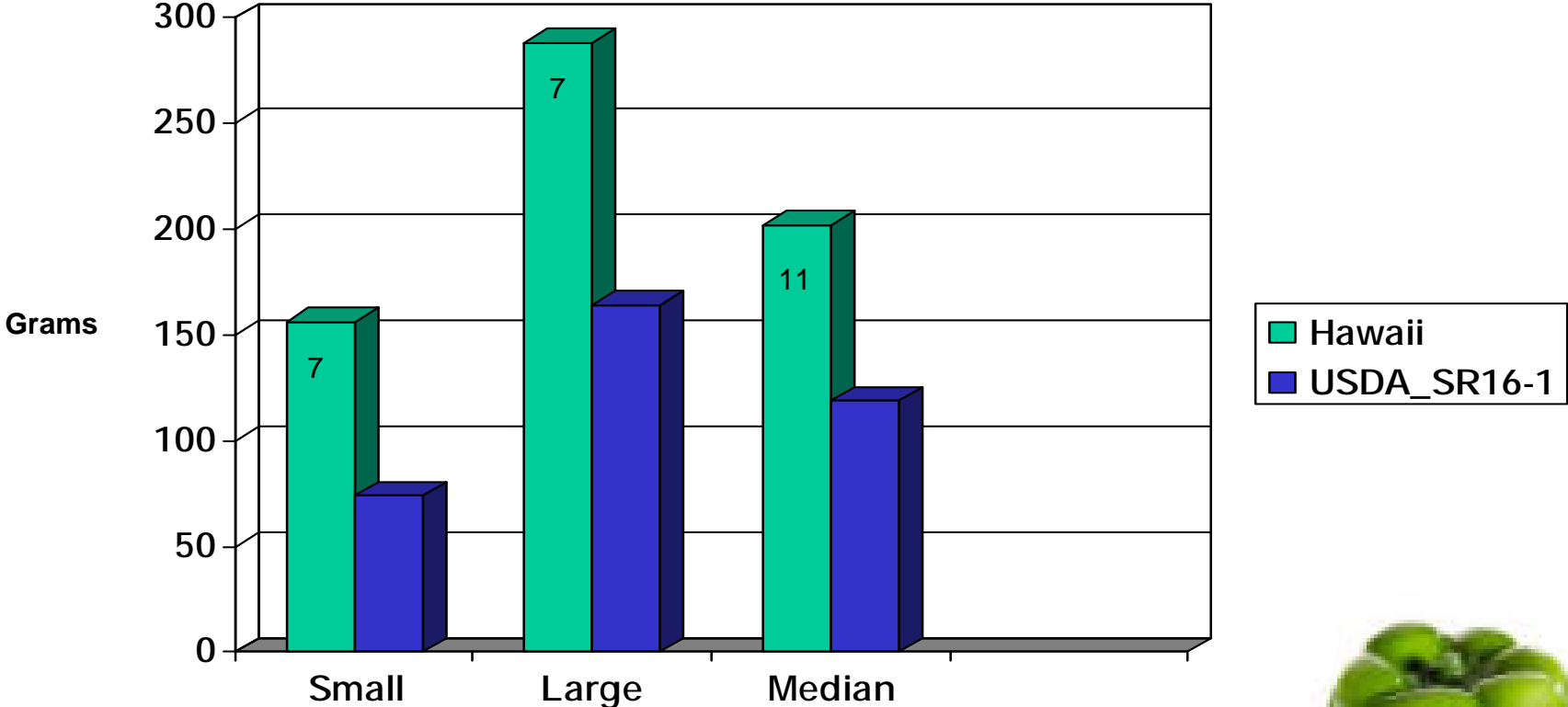
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Navel Oranges



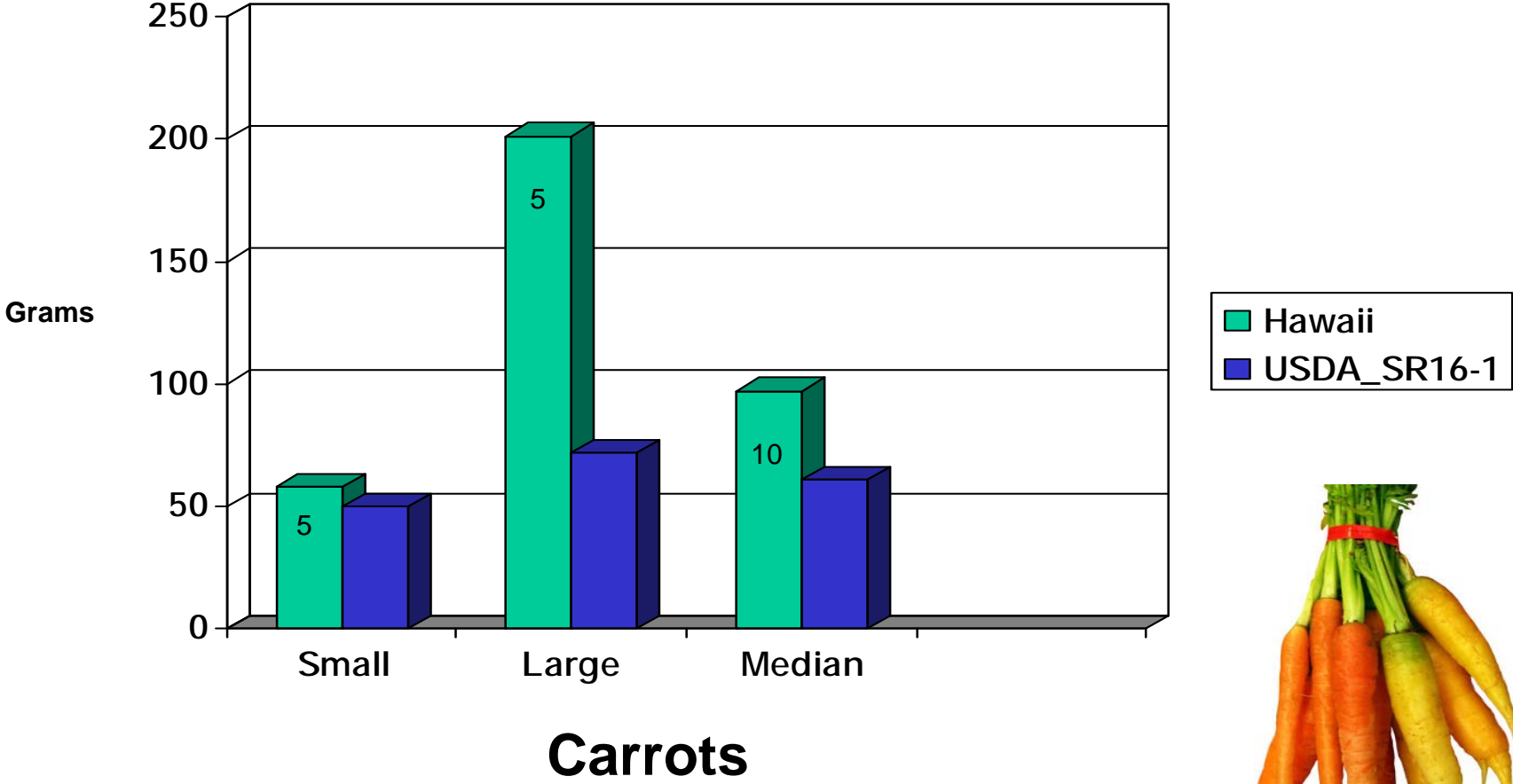
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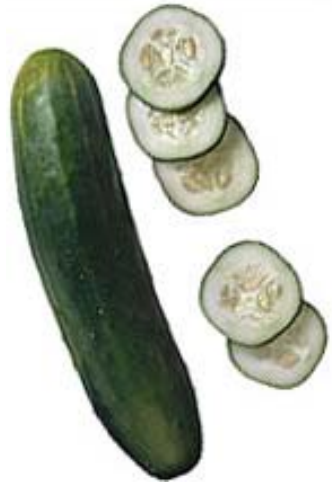
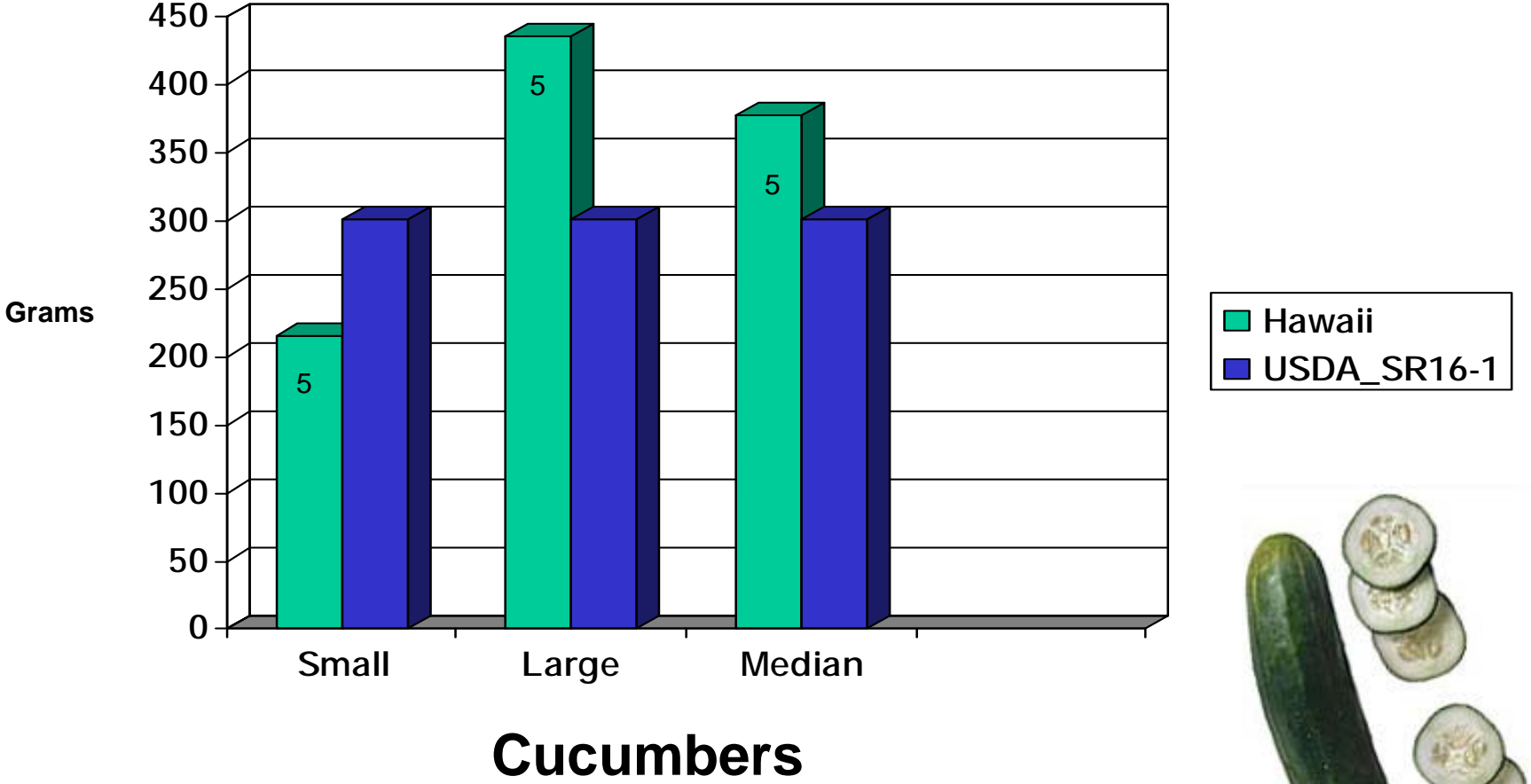
Green Bell Pepper



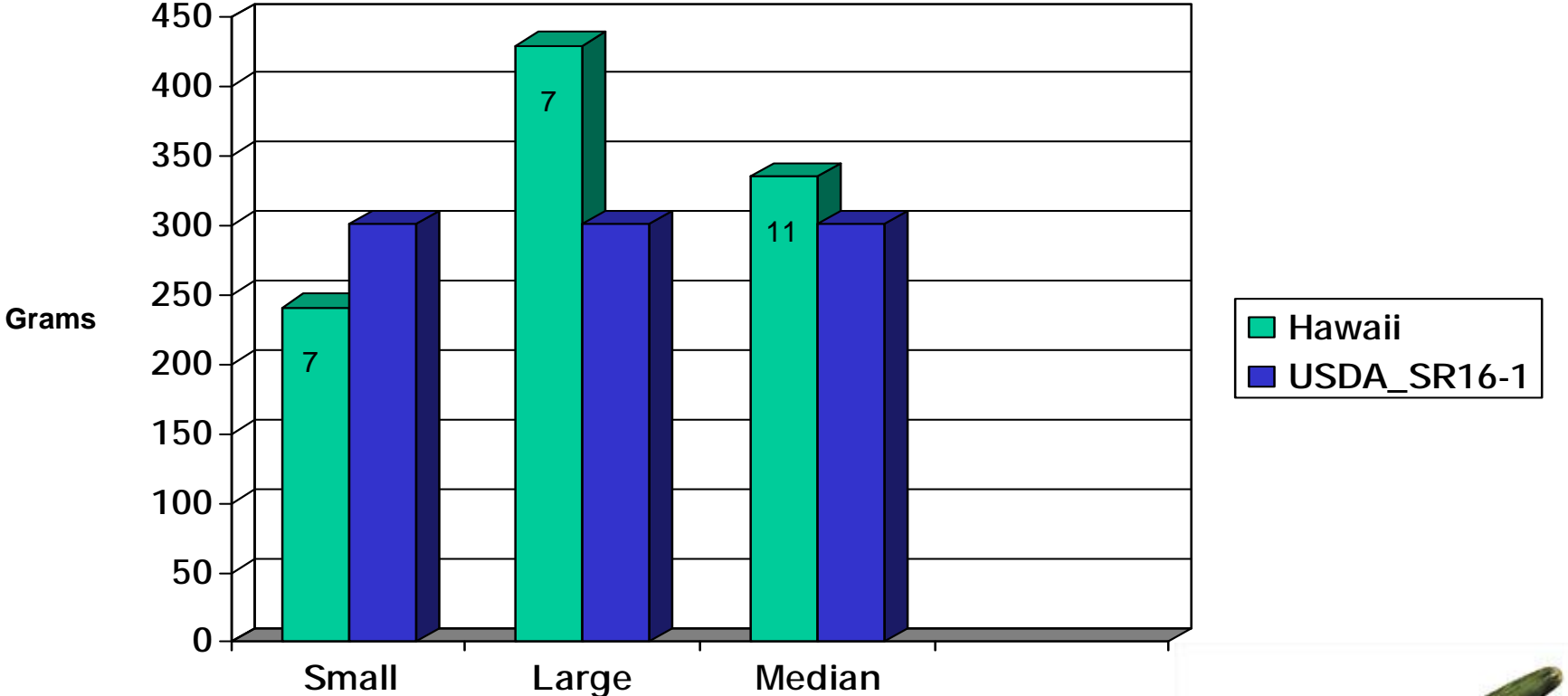
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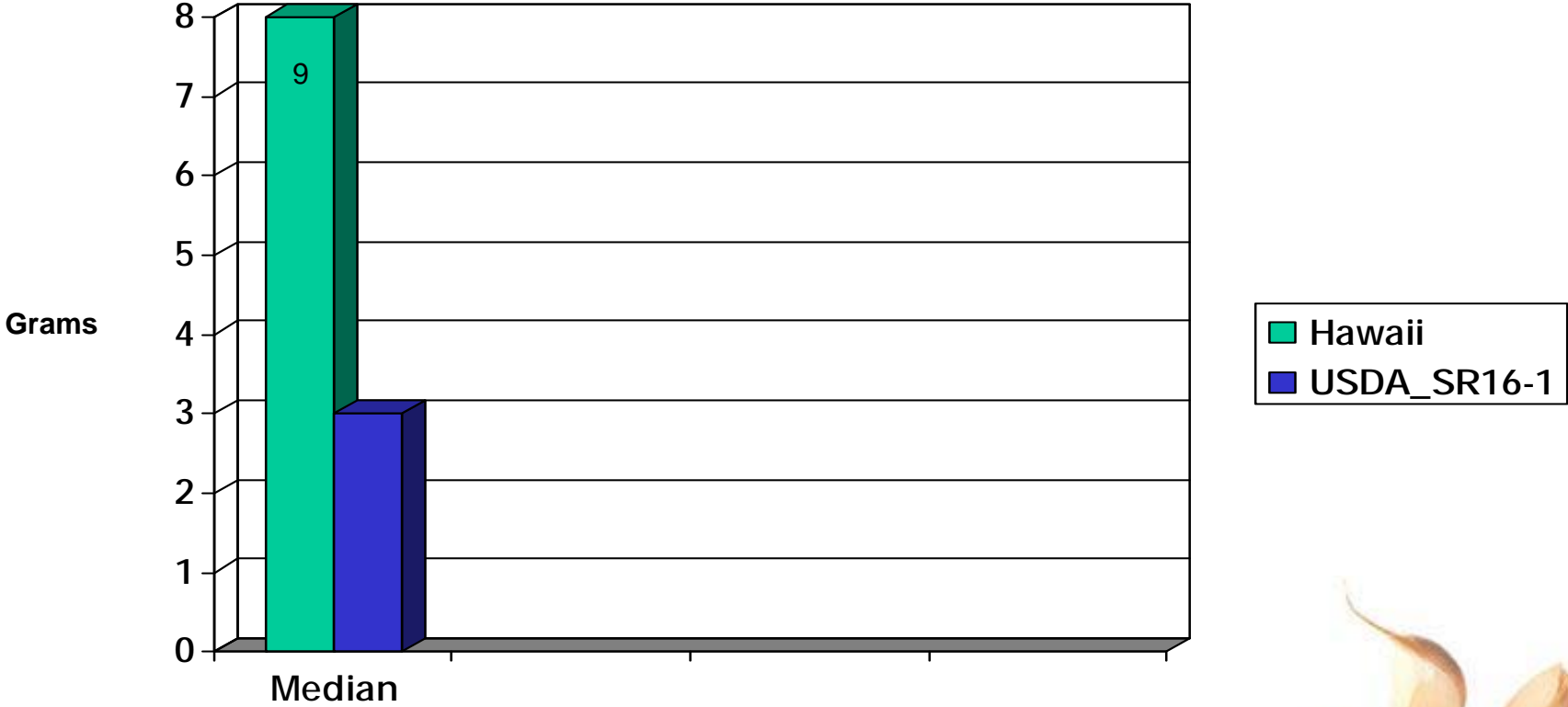
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Japanese Cucumbers



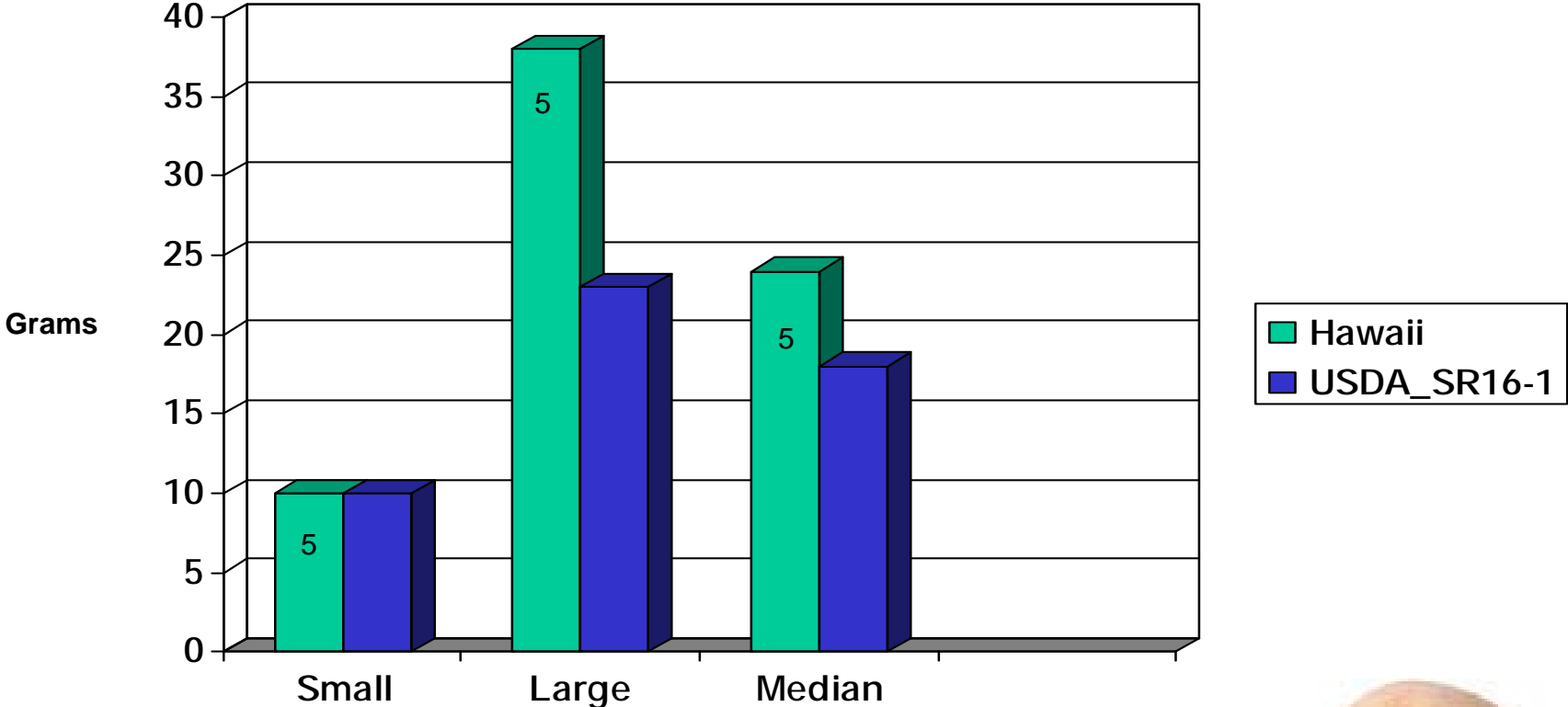
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Garlic Cloves



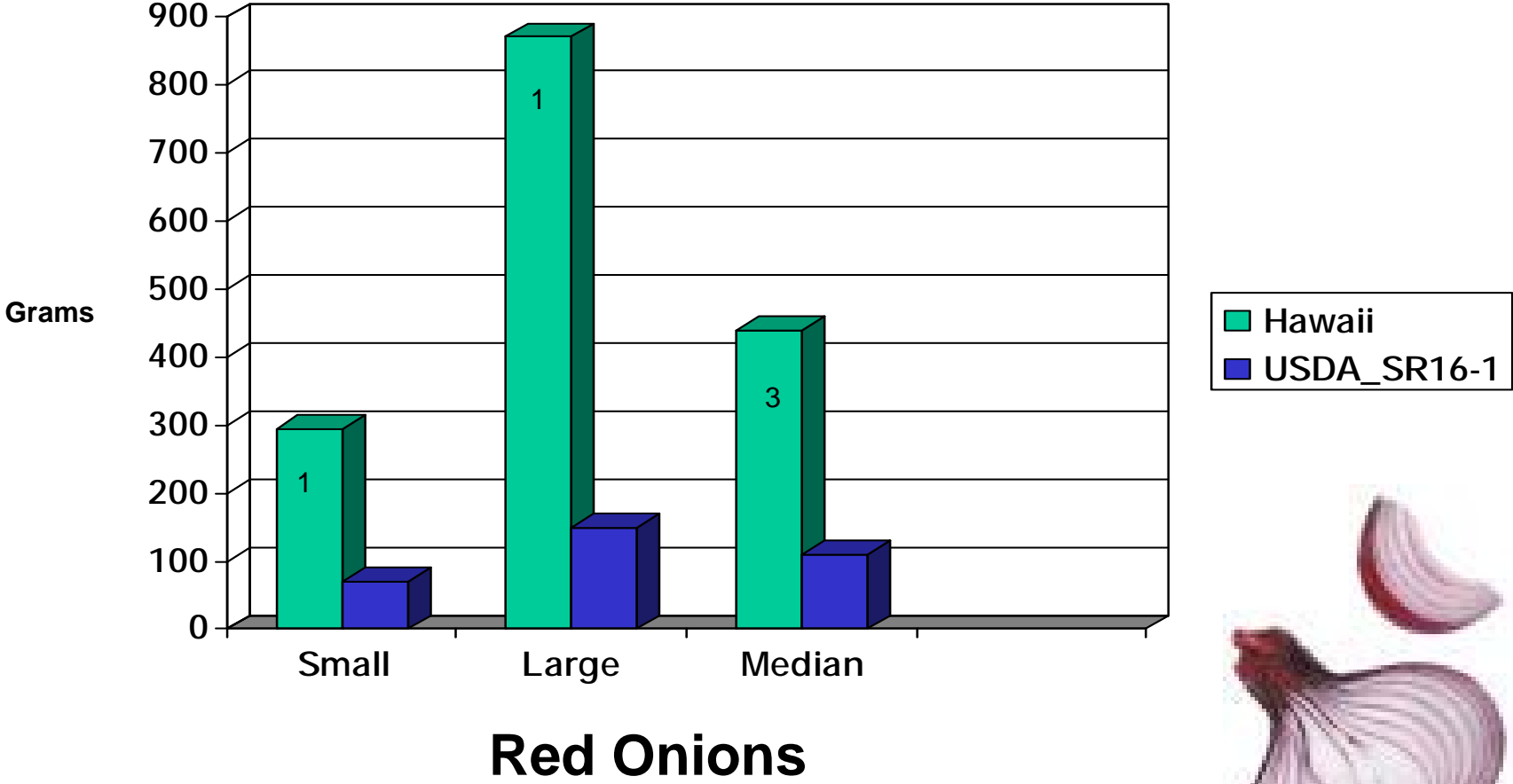
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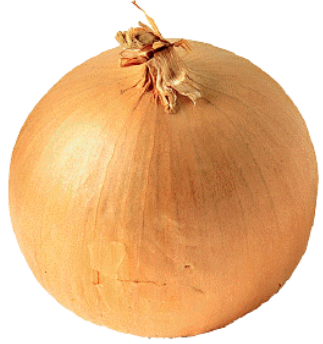
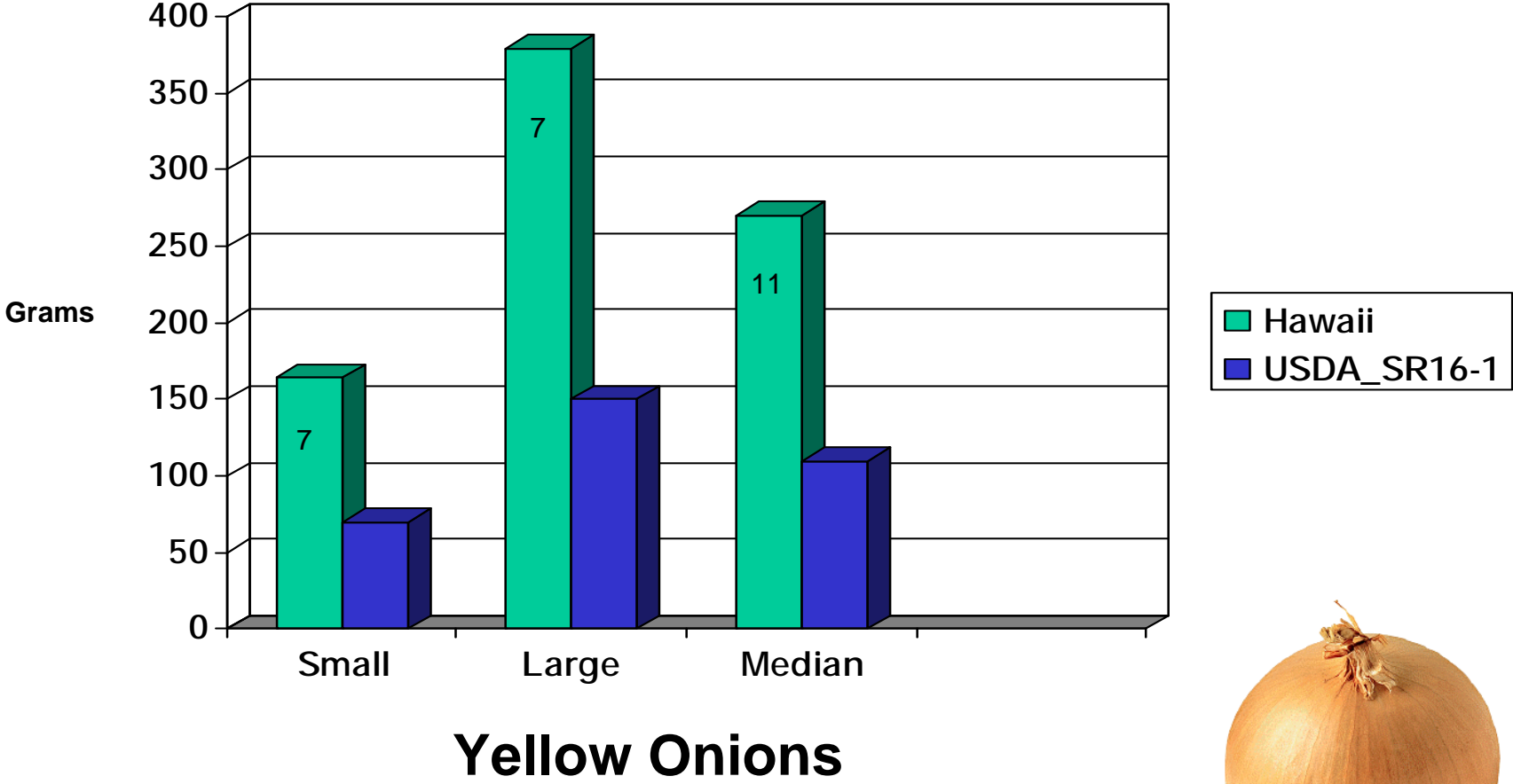
Button Mushrooms



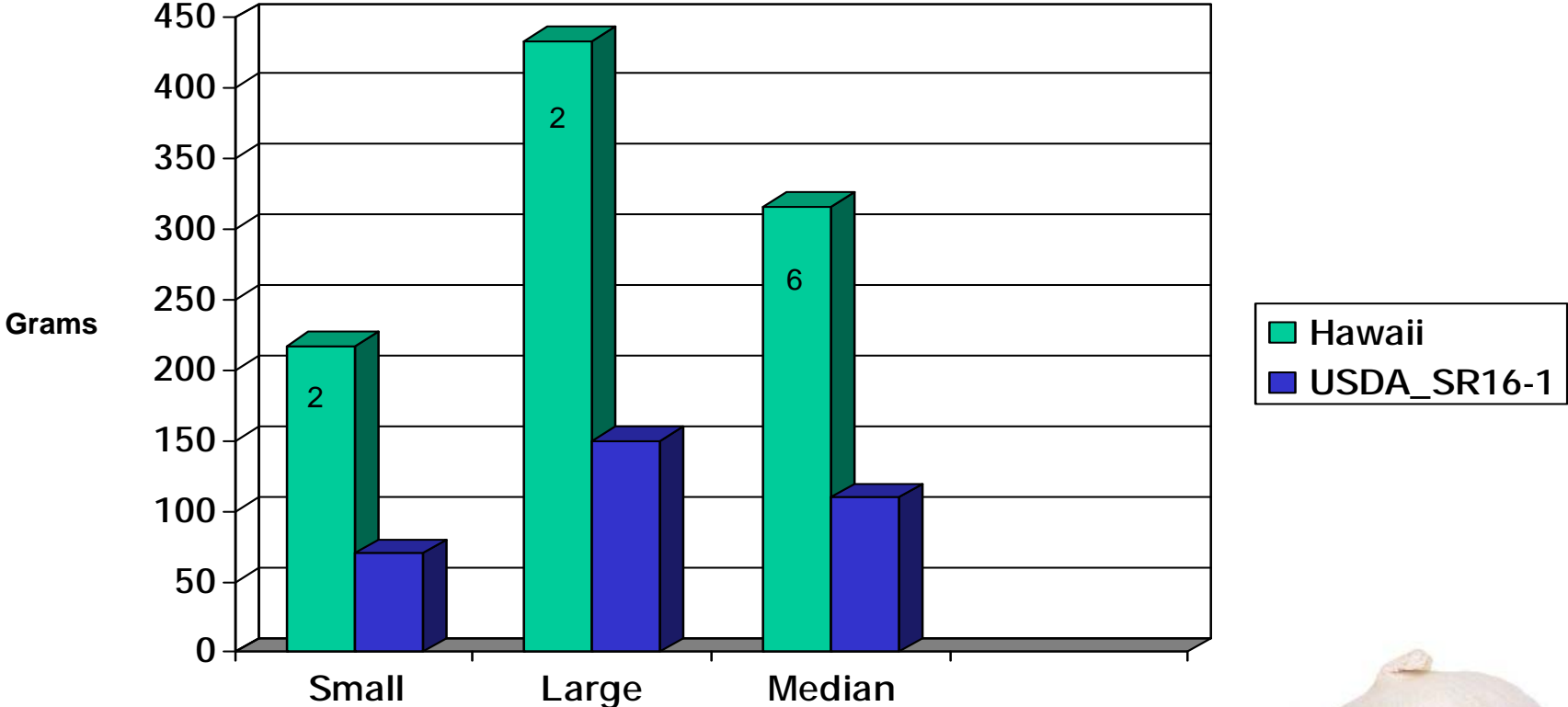
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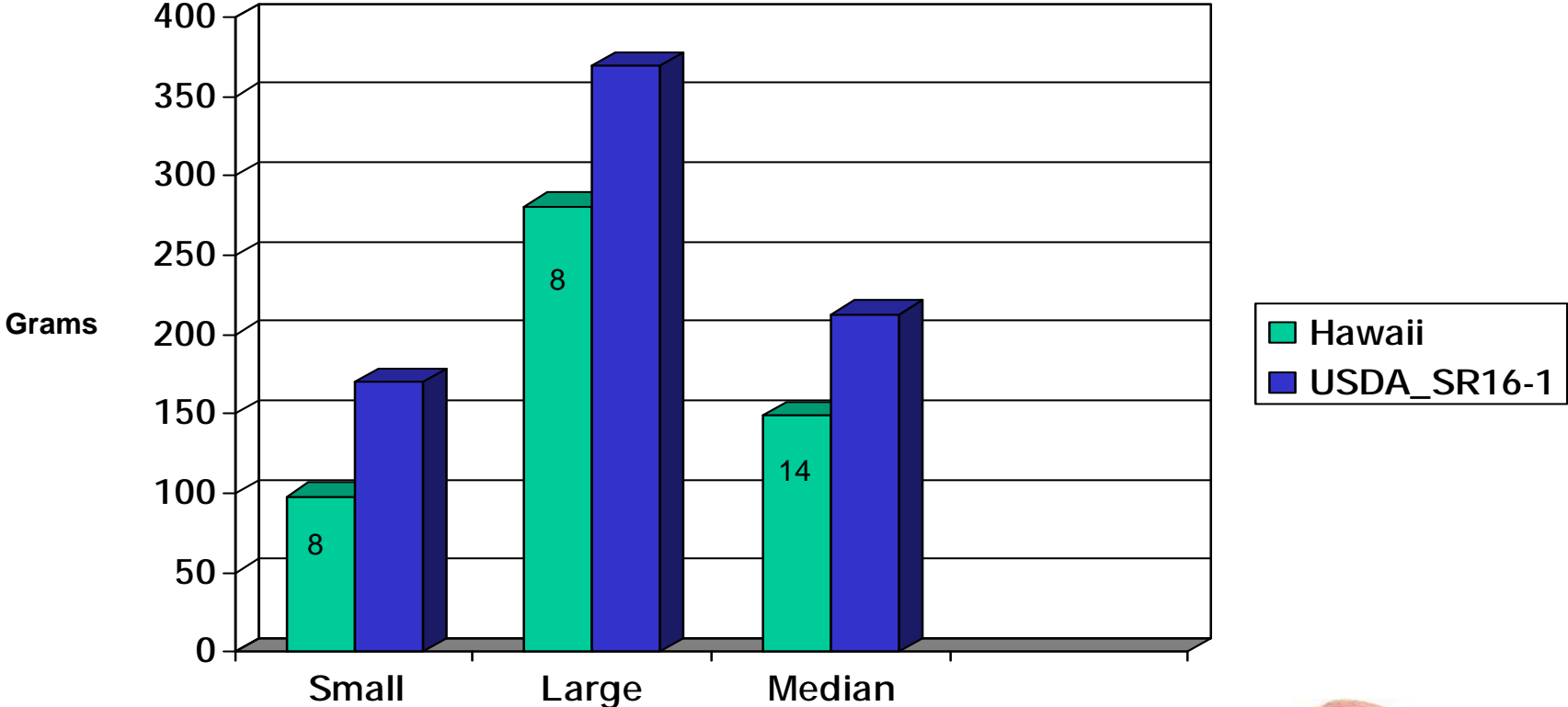
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White Onions



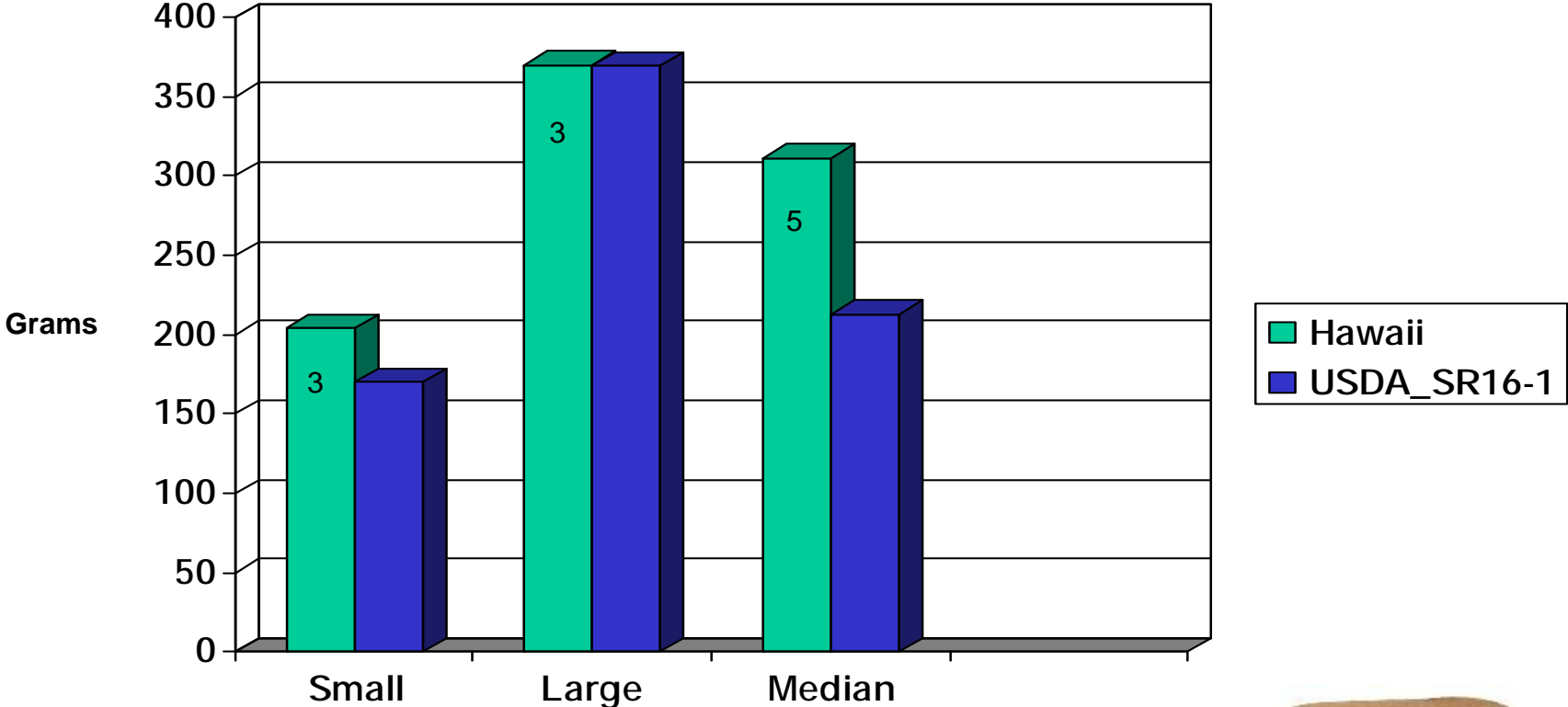
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Red Potatoes



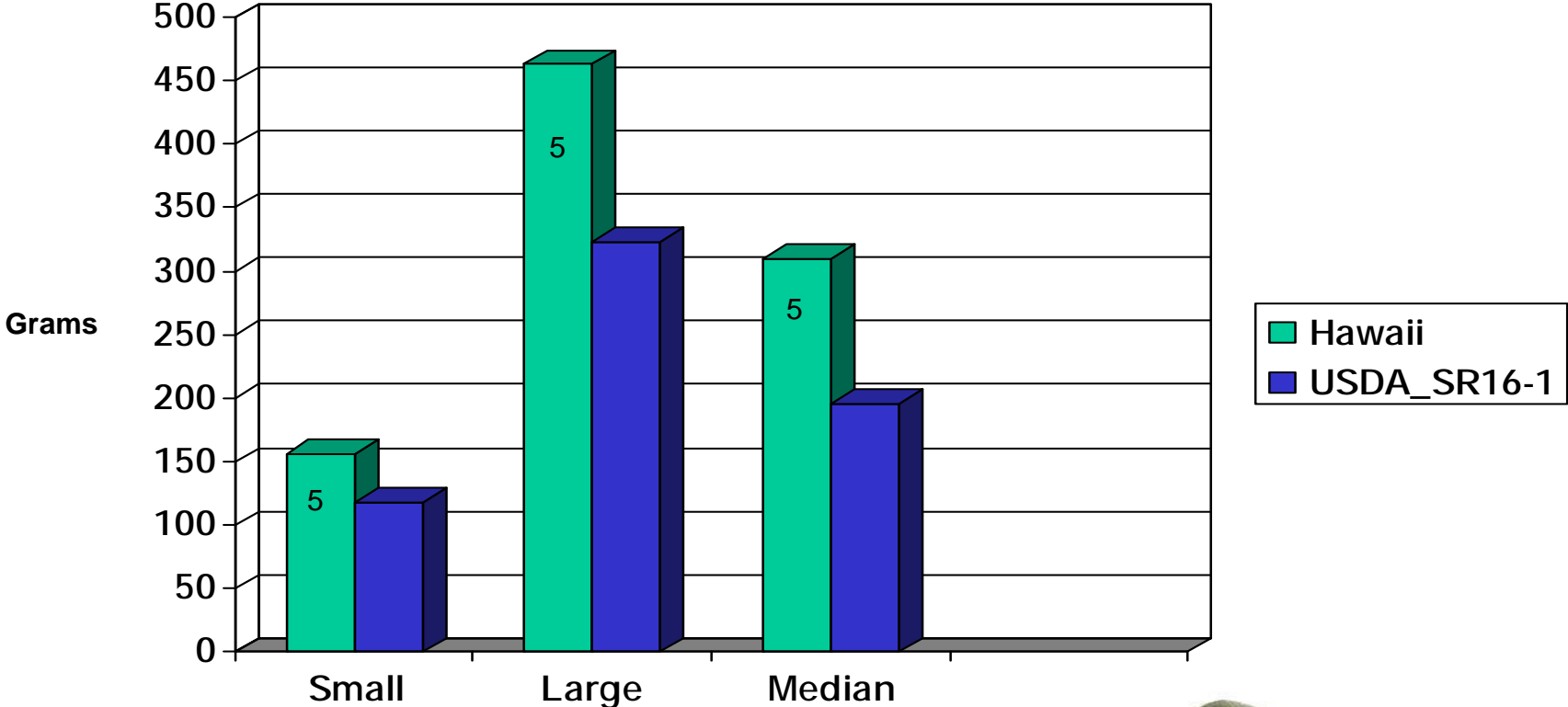
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Russet Potatoes



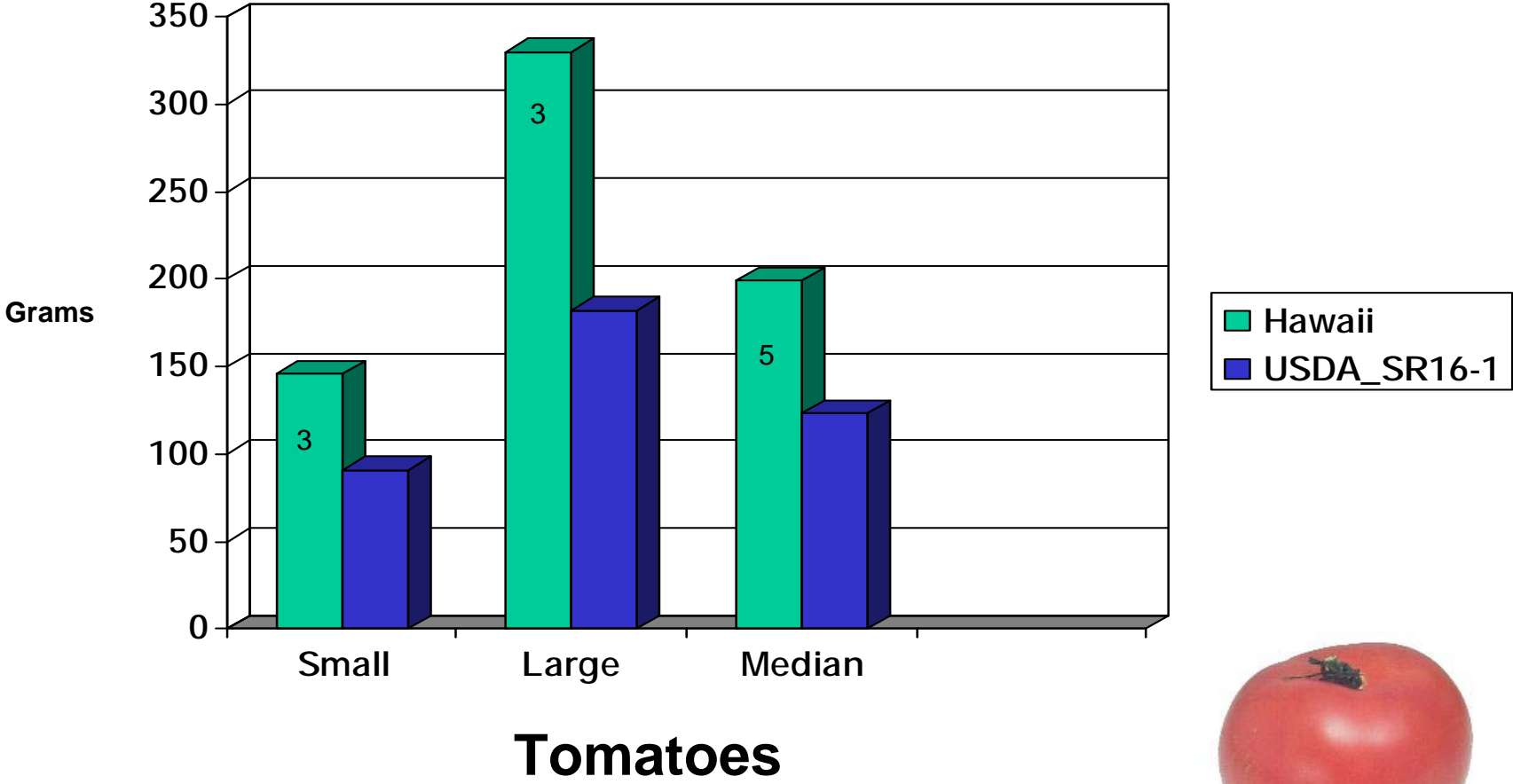
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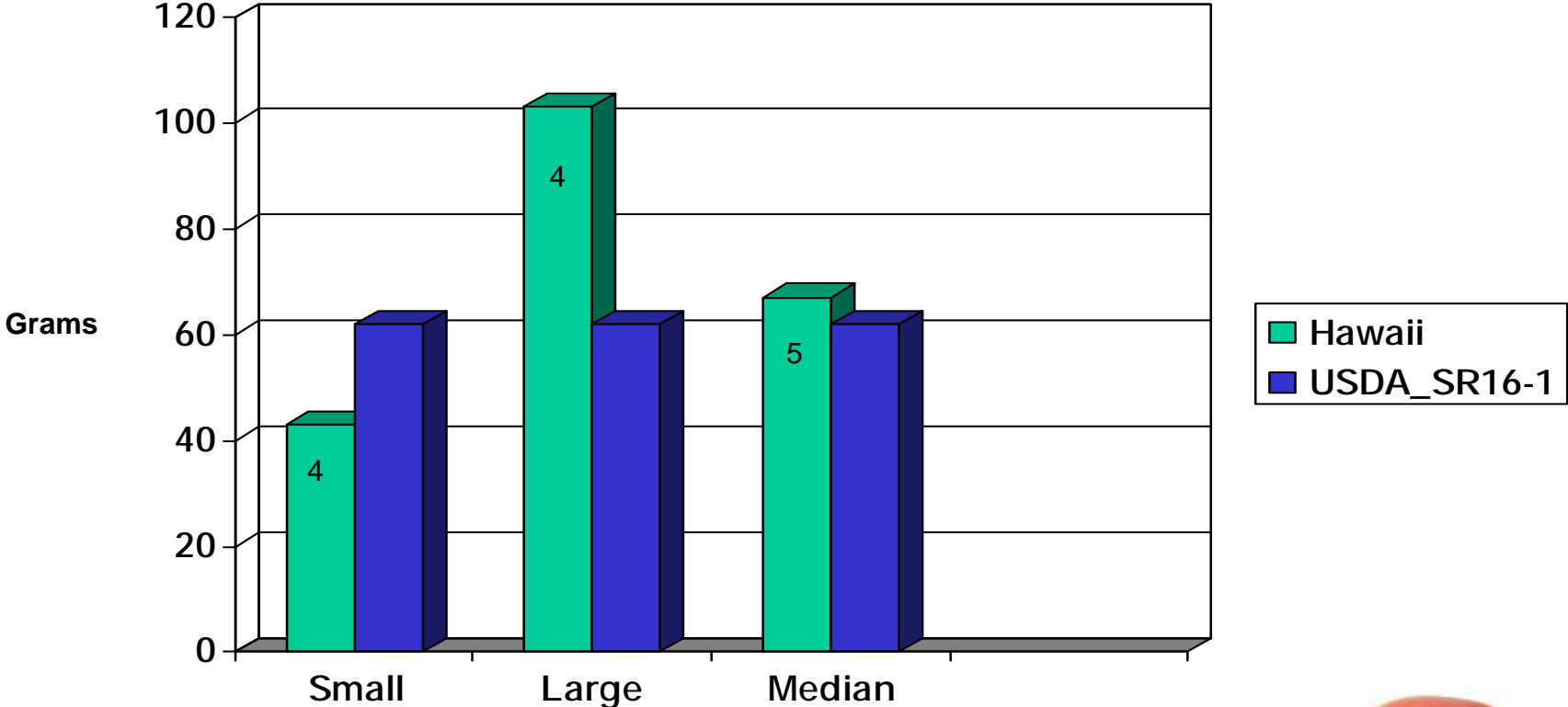
Zucchini Squash



Edible Portion Comparisons of Hawaii Store-bought versus USDA-SR16-1 Database



Edible Portion Comparisons of Hawaii Store-bought versus USDA-SR16-1 Database



Roma Tomatoes
(Plumb Tomatoes)



Difference in Energy Content between Honolulu Median and USDA SR16-1 Medium Fruit

		A	B		Potential pounds gained in a year
	USDA kcal/100g	Median kcal	USDA kcal	A – B kcal	
Apples	52	114	72	42	4.4
Avocado-Haas	167	396	289	107	11.2
Bananas	89	115	105	10	1.1
Grapefruits	32	85	82	3	0.3
Kiwi	61	44	46	-2	-0.2
Orange-Navel	49	64	69	-5	-0.5
Papaya	39	84	119	-35	-3.7
Tangerines- Honey	44	72	37	35	3.7
				Average:	2



Difference in Energy Content between Honolulu Median and USDA SR16-1 Medium Vegetables

	USDA kcal/100g	A Median kcal	B USDA kcal	A – B kcal	Potential pounds gained in a year
Bell Pepper	20	40	24	16	1.7
Carrots	41	39	25	14	1.5
Cucumber	15	57	45	12	1.3
Cucumber-Japanese	15	50	45	5	0.5
Garlic	149	12	4	8	0.8
Mushroom	22	5	4	1	0.1
Red Onion	42	185	46	139	14.5
Round (Yellow) Onion	42	113	46	67	7.0
White Onion	42	133	46	87	9.1
Red Potato	72	107	153	-46	-4.8
Russet Potato	79	246	168	78	8.1
Squash Zucchini	16	50	31	19	2.0
Tomato - loose	21	42	26	16	1.7
Tomato - plum/Italian	21	14	13	1	0.1
				Average:	3



USDA Medium Apple (138 g)



Honolulu Median Apple (230 g)



USDA Medium Apple (138 g)



Honolulu Median Apple (230 g)



Study Limitations

- Limited Locale (Honolulu)
- Limited Sample Number
- Single Season
- Based on Visual Judgment rather than weights of all (reflects consumer)



Significance/So What:

- Assuming market produce is similar in size to database values can lead to significant
 - Underestimation or overestimation of energy, nutrient, and phytochemicals consumed
- Potential error due to produce size differences may affect correctness in
 - Individual Nutrient Recommendations
 - Public Health Nutrient Recommendations
 - Evaluation of Epidemiological Data
 - Errors in Food and Restaurant Labeling



Mahalos

- For their Vision
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