Post-Harvest Processing Evaluation of Alaska Grown Potatoes

A Specialty Crop Block Grant Project

208 Total Varieties Evaluated
103 Vars. for initial screening based on:

- Specific Gravity >1.080
- Recommendation from the breeder

Initial Screening Procedure (3 months post-harvest)

- Dec 2017: Varieties cut & fried at 375°F for 3 min in Canola Oil
  - Photograph
  - Taste test
  - Fry color evaluation
    - USDA Color Standards for Frozen French Fried Potatoes (Fifth Edition, 2007)
    - Color indicates the amount of reducing sugars present in tubers

- The 15 top tasting varieties selected for additional evaluation

Quantitative Evaluation Procedure (7 months post-harvest)

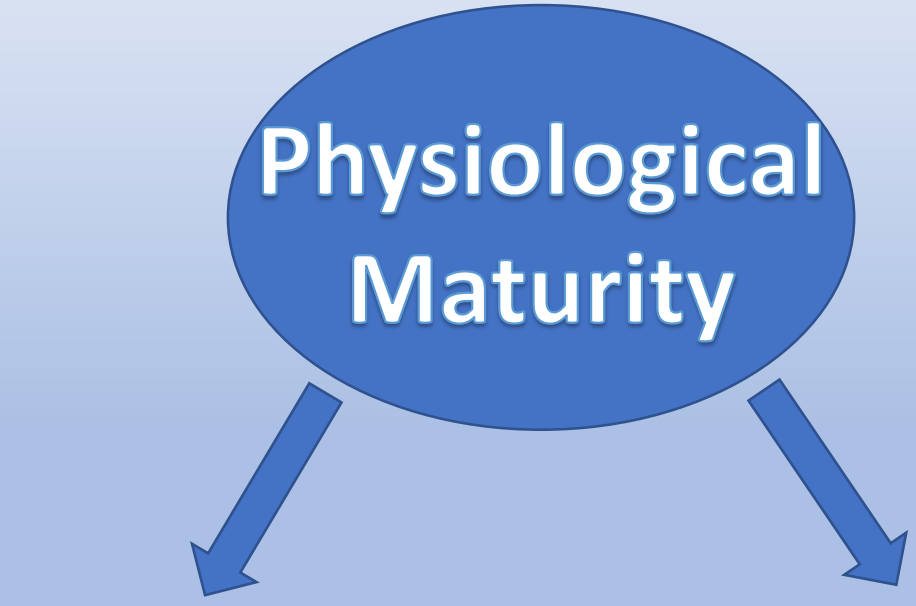
- Recondition all varieties 14 days at 60°F
- Cut and fry as previously
  - Photograph
  - Evaluate
    - 5 person panel scored the varieties based on 5 parameters: color, taste, texture, appearance & overall
  - Fry color evaluation
    - USDA Color Standards for Frozen French Fried Potatoes (Fifth Edition, 2007)

Variety	SpG 2014	SpG 2015	SpG 2016	SpG 2017	%Brix 2016	%Brix 2017	FryColor (38°F)	FryColor (60°F)
Allagash	1.094	1.083	1.075	1.096	3.9	4.7	1	1
Atlantic	1.103	1.081	1.103	1.093	6.3	5.2	3	2
Bushes Peanut	1.121	1.098	1.108	1.081	4.2	4.8	3	4
Cowhorn	1.090	1.091	1.077	1.080	Na	4.5	3	4
Gui Valley	1.109	1.094	1.107	1.098	5.5	5.5	2	2
Krantz	1.088	1.082	1.090	1.075	5.4	4.7	4	4
Peanut	1.121	1.076	1.108	1.076	4.6	4.4	4	4
Clearwater Russet			1.076	1.079	5.4	6.3	4	3
Lamoka			1.097	1.092	5.3	6.9	4	3
Lelah			1.102	1.090	5	5.8	2	3
Sage Russet		1.055	1.087	1.065	4.6	3.8	4	4
Tundra			1.091	1.086	4.9	5.1	2	3
4			1.089	1.072	6.2	5.3	4	4
Peter Wilcox			1.085	1.098	4.7	5.3	4	4
Alturas			1.079	1.076	5.9	6.0	4	4

Average evaluation scores for each variety in each category (1=low appeal, 10=high)

Variety	Color	Flavor	Texture	Appearance	Overall
Tundra*	9	7.4	7.4	8.6	8.2
Atlantic	8.4	7.4	8.4	8.2	8.2
Allagash	7.4	7.2	7.4	8	8
Gui Valley	6.2	7.4	7.6	6.4	7.2
Lelah*	7.6	7.2	5.8	7.6	7.2
Peanut	6.4	7.4	6.8	6.2	6.6
Peter Wilcox	6.2	6	6.6	6.6	6.4
Alturas*	4.6	6.2	6.6	5.4	6
Clearwater Russet*	5	6.4	6	5	5.8
4	6.6	5.6	5.6	6.2	5.6
Krantz	4	5	5.8	5.2	5.2
Sage Russet*	4.8	5	5.4	5	5
Bushes Peanut	4	5.4	5.6	4.2	5
Lamoka*	5.8	3.6	5.8	6.2	4.2
Cowhorn	4.8	3	5.4	5.4	4

Considerations for Processing Varieties



Specific Gravity

Sugar Concentration

Reproduced from "Potato Production Systems", 2003

Listed Maturity

Variety	Listed Maturity	# of days to Maturity
Tundra	Late	Early = 60-80days 9-11 weeks
Atlantic	Mid	
Allagash Russet	Early-Mid	
Gui Valley	Mid	
Lelah	Mid-early	
Peanut	Mid	Mid = 80-100 days 11-14 weeks
Peter Wilcox	Mid	
Alturas*	Very Late	
Clearwater Russet*	Mid-late	
4	No Data	
Krantz	Medium-Late	Late = 100-130^{+} days 14-19^{+} weeks
Sage Russet*	Mid-early	
Bushes Peanut	Mid	
Lamoka	Late	
Cowhorn	Mid-late	

Recommendations:

- The chemical maturity of the tubers is an important factor. Late maturing varieties will not have time to reach their highest specific gravity and lowest sugar levels which may present a problem especially after being stored.

- Reconditioning does not always improve the quality of the processed product. Know the variety with which you are working.

- The Alaska PMC would recommend Tundra, Atlantic or Allagash for consideration as potential French fry varieties.

Resources:

plants.alaska.gov/Potatoes/Publications & Reports

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