Postharvest Processing Evaluation of Alaska Grown Potatoes
A Specialty Crop Block Grant Project

Introduction

Potatoes have long been a staple produce of Alaskan agriculture. Between the years 2009-2016 Alaska growers have produced between 130,000 to 155,000 cwt annually amounting to over 2 million dollars in sales each year (2017 Alaska Annual Bulletin). There has been increasing interest in the use of Alaska Grown potatoes for processing in the local chipping and restaurant market, but this effort hasn't been supported with data on the processing quality of our locally produced potatoes. To better meet the needs of the food service industries and to promote a growing market for producers, the Alaska Plant Materials Center (PMC) undertook a postharvest evaluation on our collection of potato varieties grown on site in Palmer, Alaska.

The results of this research present timely and relevant data to Alaskan growers, processors and consumers. On a national level, the processing industry accounts for nearly 60% of potatoes produced annually. This trend has caused potato breeders to select for processing qualities, and quite a few processing cultivars have been recently registered and released for use. Although some of these newer varieties are grown here in Alaska, they have not been evaluated and compared to the data collected by growers in other regions or compared to established varieties that are known to do well here. Even if the physical qualities of the varieties were comparable to those grown elsewhere, Alaska is unlikely to compete in the national processing market because of our distance from any commercial processing facility and the small "family farm" scale of operation. On a local level, there is a favorable perception of using Alaska Grown produce that may help encourage Alaska Grown products to show up on menus across the state. That interest can only be sustained if quality products are produced and processed.

The Alaska PMC maintains a large collection of potato varieties. Several cultivars known for processing were added for this experiment including Clearwater Russet, Tundra, Lelah and Sage Russet, to name a few. The inclusion of varieties developed and used for processing added an interesting dimension to the project because the growing conditions in Alaska are significantly different from those in other potato producing states. Alaska typically experiences a short 4-month growing season with long daylengths and reduced soil temperatures compared to other regions. We also don't struggle with water shortages and are likely to receive excessive rainfall, especially as we near harvest in the autumn. Physiologically, the types of differences routinely encountered like varying specific gravity measurements and sugar concentrations are important factors affecting the processing potential of potatoes.

Methods & Materials

The entirety of the Alaska PMC maintenance collection is grown in the field annually as a matter of routine. This provides an opportunity to examine the collection for varietal purity, symptoms of disease or any anomalies, it provides a reservoir of tubers should there be a problem with the tissue culture collection and it also provides the opportunity to gather data on the varieties produced. This allows us to see natural variations in tuber characteristics as they fluctuate between growing seasons. Data on the specific gravity and tuber shape, color and size of the varieties maintained by the Alaska PMC has been collected and recorded since the 2014 field season. Degrees Brix measurements were taken in 2016 & 2017. From this data, 103 cultivars (See Appendix 1 for a complete list of the 103 screened cultivars) were selected for processing evaluation. Criteria used for selection was primarily a specific

gravity higher than 1.080 or a recommendation from the potato breeder for the cultivars use for processing. The degrees Brix measurement was also considered but was given less weight because the results proved to be highly variable.

The 2016 field season was used to add new varieties to the Alaska PMC collection and gather baseline data for the project. Data collected included tuber shape, size and color, specific gravity and degrees Brix. For comparison sugar concentration was also measured with a glucose strip and with a diabetes test kit. The glucose strip and the diabetes test kit were quickly discarded as a measure of sugar levels in the tubers because the results were consistently as high as the test could read or out of range making the expensive tests meaningless for comparison purposes.

The 2017 potato field was planted and maintained as usual. Through an operational oversight, the first 90 varieties planted did not receive any fertilizer. The tubers were smaller than usual, and yield was decreased for the affected potatoes as expected. Of the 15 varieties included in the final evaluation, Peter Wilcox, Atlantic, Allagash and Krantz did not receive any fertilizer. The tubers were planted May 30-31, 2017 and were evaluated weekly starting 5 weeks after planting. Chemical vine desiccation occurred 15 weeks after planting at 105 days, and harvest occurred 17 weeks after planting on September 26-27, 2017. In that time, we experienced 711 Growing Degree Days (GDD) according to the Alaska Climate Research Center as measured at the Palmer Airport. We also had several wind storms which damaged the vines of many varieties and likely affected yields and tuber quality as well. The top growth of the 90 field varieties that were not fertilized were markedly small and pale compared to the rest of the field although the specific gravity from the tubers was not notably inconsistent with that measured in other years when all the varieties were fertilized.

At harvest a 25-pound bag of each variety was collected and stored at 50°F with 99-100% humidity for 10-14 days. The temperature was slowly reduced over the following 2-week period to a holding temperature of 38°F and a holding humidity of 98%. After the tubers had equilibrated, a subsample of each of the 103 selected varieties weighing between 3.3-6.6 pounds was pulled and washed. This subsample was used to measure specific gravity which is determined by the formula;

$$\text{Specific gravity} = \frac{\text{weight of tubers in air}}{(\text{weight of tubers in air}) - (\text{weight of tubers in water})}$$

A Martin Lishman Digital Potato Hydrometer was used to obtain the specific gravity. Results were compared with specific gravity measurements from previous years as that data was available i.e. cultivars new to the Alaska PMC collection had fewer years of data available. Additionally, a degrees Brix measurement was taken using an Atago Pocket Refractometer Pal-1.

In December 2017, the selected varieties were removed from 38°F storage, cut with a Redco InstaCut Series 15000 with a 3/8" (1 cm) screen and fried at 375°F for 3 minutes with a Pitco Economy Gas Fryer in canola oil. The material was not rinsed or pre-prepared in any way. The fries were compared to the USDA "Color Standards for Frozen French Fried Potatoes" (Fifth Edition, 2007), assigned a color rating and photographed (See Figures 1 and 2). A panel of volunteers tasted the fries and shared their assessment which was noted. Taste was used as the most influential selection criteria and the top 15 preferred varieties were selected for the next stage of evaluation.

On April 3, 2018, the 15 selected cultivars were removed from 38°F cold storage and placed at room temperature, approximately 60°F, and allowed to undergo reconditioning for 14 days. The philosophy behind reconditioning is that at warmer temperatures the respiration rate of a tuber will increase, and it begins to convert the reducing sugars glucose and fructose back into starch thereby decreasing the sugar concentration in the tuber. Reducing sugars react with available free amino acids during frying via the Maillard reaction and high levels of reducing sugars at processing result in unacceptably dark products (fries or chips) with an unappealing burnt taste.

On April 17, 2018, after 14 days of reconditioning, a five-person panel evaluated each of the varieties after they were sliced 3/8" thick and fried at 375°F for 3 minutes in canola oil. A value between 1-10, with 1 being unacceptable and 10 representing a highly favorable critique, was assigned for the following qualities: Color, Flavor, Texture, Appearance and Overall (See Figure 3). The color score in this instance was the opinion of the panel as to whether the fry was an appealing color, it is separate from the color rating based on the USDA color score chart. The overall category was an independent assessment from the panel, it was not an average of the other 4 criteria. In addition to being evaluated by the panel, the fries were also assigned a color rating based on the USDA Color Standards chart (Fifth Edition, 2007) and photographed. The data was compiled and analyzed and was compared to the USDA fry color rating obtained in the previous evaluation. The comments from both evaluations were considered as well. From the data, each of the varieties are ranked by potential processing quality (See Figure 4).

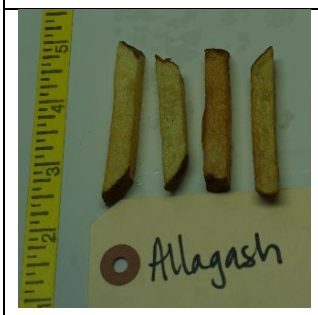
Results

Figure 1: Data for the available specific gravity (SpG), annual °Brix, USDA Fry Color of tubers direct from cold storage (38°F), and USDA Fry Color of reconditioned tubers (60°F) presented for the 15 varieties selected for the final quantitative evaluation.

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

Reconditioning and the final fry evaluation occurred approximately 7 months after harvest. Only three varieties improved their USDA color evaluation after reconditioning: Atlantic, Clearwater Russet and Lamoka. Eight varieties expressed no change in USDA fry color, however, of those varieties six had previously exhibited the lowest rating of a four, indicating an unacceptably dark fry color. Allagash and Gui Valley maintained an acceptable and consistent fry color throughout the storage period. Four varieties fried a darker color than was observed straight out of cold storage four months previously: Bushes Peanut, Cowhorn, Lelah and Tundra.

Figure 2: Some examples of the USDA Fry Color rating indicating the amount of reducing sugar present:

Rating of 1	Rating of 2	Rating of 3	Rating of 4
			

Note the small tubers resulting in short fries for Allagash and Atlantic, two of the varieties that did not get fertilized. Krantz was the darkest frying variety; darker than the USDA fry color rating of 4.

Figure 3: Average evaluation scores from the five-person assessment panel for each variety in each category (1=low appeal, 10=high)

Variety	Color	Flavor	Texture	Appearance	Overall
Cowhorn	4.8	3.0	5.4	5.4	4.0
4	6.6	5.6	5.6	6.2	5.6
Peanut	6.4	7.4	6.8	6.2	6.6
Tundra	9.0	7.4	7.4	8.6	8.2
Peter Wilcox	6.2	6.0	6.6	6.6	6.4
Allagash	7.4	7.2	7.4	8.0	8.0
Sage Russet	4.8	5.0	5.4	5.0	5.0
Atlantic	8.4	7.4	8.4	8.2	8.2
Lamoka	5.8	3.6	5.8	6.2	4.2
Bushes Peanut	4.0	5.4	5.6	4.2	5.0
Clearwater Russet	5.0	6.4	6.0	5.0	5.8
Gui Valley	6.2	7.4	7.6	6.4	7.2
Krantz	4.0	5.0	5.8	5.2	5.2
Alturas	4.6	6.2	6.6	5.4	6.0
Lelah	7.6	7.2	5.8	7.6	7.2

These 15 varieties were all selected for the final evaluation because they produced an appealing tasting French fry direct from cold storage, even though many of them fried a color darker than is acceptable to commercial processors, which typically allow a maximum color rating of 2. It is interesting to note the flavor assessment after reconditioning. Cowhorn, for example, had a very nice potato flavor straight out of 38°F storage, but had a strong unpleasantly bitter aftertaste for the quantitative assessment. Krantz, though it measured a 4 on the color rating out of cold storage, did not fry as dark as it did after reconditioning and it was a selected variety partially because it had a nice crispy skin. Lamoka as well developed what was described as an acidic aftertaste after reconditioning and received a low flavor score.

Figure 4: Varieties in order of rank based on the overall score and a description of the tuber. This data is only based on the final quantitative evaluation of the panel.

Variety	Overall Average (x/10)	Tuber Description (Alaska field**)
Tundra*	8.2	3-4" Round tuber, white skin & flesh
Atlantic	8.2	3-4" Round tuber, white skin & flesh
Allagash Russet	8.0	3-4" Blocky oblong russet, white flesh
Gui Valley	7.2	3-4" Round tuber, white skin & flesh, pink eyes
Lelah*	7.2	3-4" Round tuber, white skin & flesh
Peanut	6.6	3-4" fingerling, tan skin, light yellow flesh
Peter Wilcox	6.4	3-4" blocky oblong tuber, variable purple skin, pale yellow flesh
Alturas*	6.0	5" Oblong russet, white flesh
Clearwater Russet*	5.8	4-7" Oblong russet, white flesh
4	5.6	4-6" Oblong russet, pale yellow flesh
Krantz	5.2	4-5" Blocky oblong russet, white flesh
Sage Russet*	5.0	5-6" Oblong russet, pale yellow flesh
Bushes Peanut	5.0	5-7" Fingerling, tan skin, light yellow flesh
Lamoka*	4.2	4" Blocky round tuber, pale yellow flesh
Cowhorn	4.0	4-5" length fingerling, dark purple skin, white & purple flesh

***** Registered varieties that fall under Plant Variety Protection (PVP) regulations.

**Results from Alaska PMC only; tuber sizes are likely very different under different growing conditions.

Discussion

Potatoes grow very well in Alaska. They thrive in our short, cool summers and the tubers store extremely well through our long winter season. Potatoes have been used as a source of winter vegetables in South-East Alaska for over 200 years according to an article by Charles Bingham (2018) on the Sitka Local Foods Network. Even so, the Alaska potato growers face intense competition from high volume growers in other states that supply table stock and seed to local stores and nurseries. One of the comments we often hear from the growers is that they could easily produce more potatoes, but the market only supports a limited volume. It is encouraging to hear about a new venue for Alaska grown potatoes as a processing product. These conditions that make the potato a trusted dietary staple, however, offer some challenges to producing a high-quality processing potato.

One of the most common assessments for processing suitability is specific gravity, or a measure of the density of a tuber. Starch is the most abundant compound composing tuber solids and is therefore the most influential factor affecting tuber specific gravity (Potato Production Systems, 2003). A high starch content is preferred by processors because it gives a dry, flaky texture and decreases processing costs by reducing the amount of raw material needed, reducing the cooking time and reducing the amount of oil absorbed compared to tubers with higher water content i.e. low specific gravity (Potato Production Systems, 2003). The amount of starch in a tuber is primarily variety specific, but it is influenced by environmental and management factors and therefore has a seasonal and regional variability. Some of the environmental factors in Alaska that affect specific gravity are the chemical maturity of the tubers and the amount of moisture in the soil at harvest. Alaska has a short growing season and many processing potatoes tend to be late maturing varieties. Very late maturing varieties, like Russet Burbank, reach chemical maturity between 146-149 days in Parma, Idaho (Waxman, et al., 2018). The onset of frost and decreasing air temperatures require that we harvest before the tubers can meet that time standard. At chemical maturity, the sucrose level in the tubers reaches its minimum concentration and the starch content reaches its maximum concentration (Sowokinos, et al., 1988). Therefore, harvesting before potato tubers reach their chemical maturity results in low specific gravity and increased levels of sucrose which leads to higher levels of reducing sugars during storage. Chemical maturity also affects the metabolic activity of potatoes. If the potatoes are still growing, they are in a high metabolic state and will continue to absorb excess water from the soil if high moisture levels are present. A high-water content in the tubers will decrease the specific gravity measurement. Alaska is typically very cool and rainy in the fall and high moisture levels are consistently present in the soil.

Figure 5: Field 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	

In addition to specific gravity, another metric used to evaluate the processing potential of a potato variety is the amount of sugar present in the tubers at the time of use. Some varieties are best suited to processing fresh from the field and some can tolerate extended periods of storage. These considerations are a function of how the tuber processes sugar, specifically sucrose ($C_{12}H_{22}O_{11}$). Sucrose is produced by photosynthesis and is translocated to the tuber where it is formulated into starch and excess sucrose is stored. After harvest, the enzyme invertase becomes active in the tuber hydrolyzing stored sucrose into the 6-carbon sugars fructose and glucose (Sowokinos et al., 1988). The effect of this reaction, referred to as cold induced sweetening or CIS, is variety specific and CIS resistance has been a focus in the development of new processing varieties (Gupta, 2017). Fructose and glucose are the reducing sugars that participate in the Maillard reaction causing dark color in fried products. Sucrose does not cause the same problematic darkening when present in the tubers. Therefore, a variety with a high sucrose content can be successfully processed fresh from the field but may turn unacceptably dark when fried just a few days after storage. If a cultivar is susceptible to CIS, cold storage temperatures will exacerbate the production of reducing sugars (Rosen et al., 2018). Often product designated for commercial processing will be stored at 45-50°F to minimize the sweetening effect. It would have been very interesting to do a fry and evaluation straight out of the field and then store the varieties that were processed for this trial at various temperatures, however, the Alaska PMC only has a single field storage unit and it is purposed for storing and keeping healthy seed from harvest to spring planting, so this trial was a "worst case scenario" for processing storage conditions.

Some take away points to consider when selecting varieties to grow and process in Alaska:

- 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.
- Avoid the varieties in Appendix 1 that did not fry well. The Alaska PMC would recommend Tundra, Atlantic or Allagash for consideration as potential French fry varieties.

References

Bingham, Charles. "Forest Service, Sitka Tribe to harvest Tlingit potato garden for community on Oct. 19 (changed to Oct. 24)". *Sitka Local Foods Network*, 12 October, 2018, p. 2. sitkalocalfoodsnetwork.org

Gupta, S.K., 2017. Predictive Markers for Cold-Induced Sweetening Resistance in Cold Stored Potatoes (*Solanum tuberosum* L.). *American Journal of Potato Research* 94 (4): 297-305.

Rosen, C., Sun, N., Olsen, N.,Thornton, M., Pavek, M., Knowles, L., Knowles, N. 2018. Impact of Agronomic and Storage Practices on Acrylamide in Processed Potatoes. *American Journal of Potato Research* 95 (4): 319-327.

Sowokinos, J.R. and D.A. Preston. 1988. Maintenance of potato processing quality by chemical maturity monitoring (CMM). Station Bulletin 586-1988 (Item No. AD-SB-3441). MN Agricultural Experiment Station. University of Minnesota.

Sowokinos, J. R. and Love, S.L. 2003. Tuber Quality, *In* J. C. Stark and S. L. Love, (ed) *Potato Production Systems,* p. 329-343, University of Idaho Agricultural Communications.

USDA, National Agricultural Statistics Service, 2017. Alaska Agricultural Statistics 2017 Annual Bulletin. https://www.nass.usda.gov/Statistics_by_State/Alaska/Publications/Annual_Statistical_Bulletin/2017/AKANNUAL2017.pdf

Waxman, A., Stark, J., Guenthner, J., Olsen, N., Thornton, M., Novy, R., An Economic Analysis of the Effects of Harvest Timing on Yield, Quality, and Processing Contract Price for three Potato Varieties. *American Journal of Potato Research* 95 (5): 549-563.

Appendix 1: Full list of varieties screened for processing potential

Variety	SpG 2014	SpG 2015	SpG 2016	°Brix 2016	SpG 2017	°Brix 2017	Fry Color	Comments
772	1.087		1.102	4.2	1.086	5.2	3	not fluffy, not weird
AK Sweetheart	1.105	1.085	1.089	5.9	1.088	4.8	4+	strange taste, OK consis
Alaska Russet	1.102	1.095	1.1	4.6	1.098	5.2	4	OK
Allagash Russet	1.094	1.083	1.075	3.9	1.096	4.7	1	Good! Not as fluffy as hoped
Atlantic	1.103	1.081	1.103	6.3	1.093	5.2	3	Good
Bakeking	1.103	1.079	1.092		1.083	5.8	4+	Burnt flavor
Banana	1.093		1.083	6.1	1.077	4.2	4	Potato flavor (I liked it)
Belisle	1.09	1.087	1.084	3.5	1.068	4.3	4	Don't like
Bintje	1.088	1.092	1.09	4.8	1.088	4.4	4	Good consis & flavor
Blue Shetland	1.089	1.089	1.089	5.9	1.093	6.8	3	mushy-strange flavor
Brigus	1.08	1.078	1.093		1.081	4.6	4	plain taste
Bushes Peanut	1.121	1.098	1.108	4.2	1.081	4.8	3	Good-fair fry
Caribe		1.083	1.087	5.1	1.073	4.4	4	not good
Century Russet	1.101	1.075	1.084	6.6	1.079	5.1	4	Hard fry, not good
Cherry Red	1.086	1.098	1.083	6.5	1.074	5	4+	not done
Chieftain	1.081	1.086	1.088	6.2	1.082	5.1	4+	taste burnt
Cornell 114		1.078	1.091	5.5	1.08	6.4	4+	burnt taste, not good
Cowhorn	1.09	1.091	1.077		1.08	4.5	3	Good potato flavor
Denali	1.106	1.088	1.097	5.3	1.092	5.8	4	OK fry
Eersteling	1.09	1.081	1.089	4.3	1.087	5.6	3	strange aftertaste
Favorite Red	1.107	1.087	1.083	5	1.085	4.9	4	bitter-yuck
Frontier Russet	1.093	1.076	1.097	6.1	1.08	5.5	4	not good taste
Goldrush	1.101	1.07	1.078	6.2	1.084	5.1	4+	OK-no strange taste
Green Mountain	1.096	1.08	1.078	7.1	1.073	5.8	4+	burnt flavor
Gui Valley	1.109	1.094	1.107	5.5	1.098	5.5	2	Good! Flavor & consis OK
Haida	1.096	1.077	1.095	6.7	1.084	6.1	4	strong bitter spud taste

Hilat Russet	1.099	1.083	1.087	6.6	1.093	5.5	4	dense-not weird taste
Hilite Russet	1.101	1.08	1.073	5.6	1.08	5	4	sweet flavor
Kennebec	1.087	1.075	1.09	5.7	1.07	5.3	4	no
Kifli	1.084	1.069	1.102	6.9	1.075	5.2	4	burnt, limp
King Edward	1.095		1.084	5.6	1.071	4.2	4	OK-not strange
Krantz	1.088	1.082	1.09	5.4	1.075	4.7	4	Good. Crispy skin
Lemhi	1.103	1.078	1.114	5.9	1.086	4.8	4	Burnt skin, not fully cooked
Lenape	1.096	1.096	1.099	6.4	1.097	6	4	OK-not a standout
Mainestay	1.092		1.092	6.2	1.083	6	4+	Burnt! Very! Yuck
Mark Varshaw	1.1	1.077	1.105	5.1	1.074	5.7	4	Burnt
Myatt's Ashleaf	1.094	1.084	1.092	5.3	1.091	5.5	4	OK-no standout
Nicola	1.083	1.073	1.086	6.6	1.074	6.1	4	Burnt
Norgold Russ	1.092	1.071	1.09	6.3	1.079	5.3	4	Not Good-burnt
Norking Russ	1.095	1.078	1.087	3.7	1.082	5.2	4	Burnt, limp, strange taste
NY128	1.099	1.076	1.105	4.4	1.086	5	4	No
O'Keefe Superior	1.088	1.07	1.096	7.2	1.08	6.3	4	so-so
Peanut	1.121	1.076	1.108	4.6	1.076	4.4	4	OK, prob. Best so far
Pike	1.093	1.07	1.085	6.1	1.087	7	4+	burnt
Pimpernel	1.101	1.082	1.098	7.8	1.089	6.6	4	burnt
Purple Viking	1.095	1.078	1.095	5.6	1.074	4	4	bad flavor
Ramblin' Rose	1.107	1.077	1.09	5.9	1.081	4.3	4	OK-not weird
Ranger Russet	1.102	1.081	1.082	5.9	1.072	5.4	4	burnt
Ratte	1.104	1.066	1.086	4.9	1.073	5.6	4	Strange Flavor
Red Beauty	1.081	1.069	1.083	4	1.072	5.8	4	Burnt, otherwise OK
Red Gold	1.093	1.087	1.089	5.3	1.087	5.2	4	Yuck
Ricter's Jubel	1.092	1.084	1.103	5.8	1.088	5.2	4	No
Robinta	1.09	1.078	1.099	5.6	1.08	4.4	4	No
Rose Gold	1.087	1.079	1.085	5.6	1.083	4.8	4	No
Russet Burbank	1.093	1.071	1.087	4.7	1.075	5.4	4	No
Russet Norkota	1.102	1.068	1.094	5.8	1.076	5.7	4	Strange
Shepody	1.082	1.065	1.095	5.3	1.075	6.7	4	Yuck
Skerry Blue	1.093	1.087	1.091	3.9	1.08	5.4	3	OK
Slovenian Crescent	1.093	1.082	1.083	6.3	1.08	5.4	4	Limp,OK flavor, burnt edges
Snowchip	1.085	1.088	1.091	5.5	1.083	7.5	4	no
Stick Valley	1.08	1.077	1.1	6.7	1.086	6.7	4	Some like it, I don't
Suncrisp	1.102	1.098	1.105	6.2	1.092	7.4	4	No
Sunrise	1.087	1.078	1.086	5.6	1.085	5.8	4	Yuck
Superior	1.09	1.071	1.088		1.076	6.2	4	Yuck
Taebok Valley	1.087	1.087	1.109	4.5	1.084	6.9	4	Sweet-OK
Teton Russet	1.099	1.08	1.103	6.5	1.086	6.7	4	No

Yam	1.098	1.091	1.092	5.2	1.081	4.9	3	dense, don't like it
Yellow Finn	1.089	1.084	1.076	5.6	1.078	6.8	4	No no no
Yukon Gem	1.086	1.078	1.087	3.2	1.078	4.6	4	OK, aftertaste bad
Yukon Gold	1.088	1.084	1.088	6.2	1.084	6.5	4	No
06-363		1.092	1.088	5.8	1.083	5.1	4	no, OKish
Alegria		1.07	1.1		1.073	8.7	4+	smell burnt, taste burnt
Alpine Russet		1.067	1.08	5.7	1.077	5.6	3	so-so
Clearwater Russet			1.076	5.4	1.079	6.3	4	good
Crestone Russet		1.071			1.068	5.8	4	
Defender		1.072	1.071	6.3	1.069	7.1	4	burnt
Lamoka			1.097	5.3	1.092	6.9	4	nice
Lelah			1.102	5	1.09	5.8	2	pretty good
Megachip			1.098	6.3	1.083	5.6	4	so-so
ND 7882 B			1.078	6.3	1.076	6	4	burnt-yuck
ND 8068-5		1.087	1.087	4.9	1.075	6.2	4	ok-not weird
Premier Russet			1.084	5.4	1.061	5.1	4	hollow heart, No
Russ Norkotah sel3		1.071	1.074	5.6	1.068	6.3	4+	no, burnt
Sage Russet		1.055	1.087	4.6	1.065	3.8	4	so-so, not fully cooked
Trailblazer			1.087	5.7	1.076	5.8	4	no-
Tundra			1.091	4.9	1.086	5.1	2	good
Umatilla Russet			1.085	5.7	1.063	4.9	4	burnt
W2978-3			1.082	5.1	1.07	5.3	4	bitter
W6234-4 Russet			1.084	5.1	1.078	5.7	4	OK-potato taste, underdone
WND 8625-2Russ		1.086	1.086	5.7	1.079	5.4	4	strong potato taste
4			1.089	6.2	1.072	5.3	4	yuck-RC liked it
5			1.082	5.4	1.063	5.8	4	limp, underdone, burnt
Crestone Russet			1.08	4.9	1.071	4.9	4	No
Caribou Russet			1.088	6.6	1.086	7.1	4	Sweet, burnt
Peter Wilcox			1.085	4.7	1.098	5.3	4	pretty good
Pomerelle			1.081	6.2	1.076	6.3	4	burnt
Satina			1.084	4.9	1.072	4.9	4	yuck, burnt strange flavor
Palisade			1.087	6	1.08	7	4	burnt
Canela			1.083	5.2	1.078	4.5	4	ok
Alturas			1.079	5.9	1.076	6	4	ok
Silverton Russet					1.052	5.9	4+	yuck, burnt

Contacts: For questions or comments on this topic please feel free to contact:

Rob Carter: (907) 745-8127, Robert.Carter@alaska.gov
Christine Macknicki: (907) 745-8021, Christine.Macknicki@alaska.gov