

T H E S I S

On

THE COMPARATIVE COOKING QUALITIES OF CERTAIN VARIETIES OF
POTATOES

Submitted to the

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INTRODUCTION.

The potato, since its introduction into Europe from South America, by way of the Virginia colony¹, has played a very important part in the dietetics and the economic situations of the civilized nations of the world. Next to cereals it has become their staple food, and a failure of the crop in the larger growing centers means famine and misery to many of the most highly organized industrial nations.

It is the one crop which Great Britain raises in sufficient amounts to feed her people. It is the main dependence of Germany both as a food and as a source of many commercial products. It is an indispensable article of diet in American homes, both rich and poor, furnishing, according to Langworthy, one-eighth of the entire diet of one-twelfth of the carbohydrate used.

Since the potato has become such a staple food (only the Oriental people exist without it) it seems indeed strange that so little practical knowledge of the varieties, their advantages and disadvantages, is available.

To most housewives a potato is merely a potato, and they must accept the grocer's or grower's word for the quality of a given lot, because they have no fund of knowledge of varieties upon which they may rely in their judgment, as they have in the case of many of the fruits and certain other vegetables. Realizing the need of greater available information this investigation was undertaken for some of the varieties common in Oregon.

¹ "The Potato", by Grubb and Guilford, page 515.

The following is a list of the varieties used in these experiments:

Carmen #3,	Corvallis, Oregon.
Pearl,	" "
Peachblow,	" "
Sir Walter Raleigh,	" "
Pingree,	" "
Sir Walter Raleigh,	Sherwood, "
American Wonder,	New Era "
Burbank,	" " "
Burbank,	Saint Paul, "
Gold Coin,	Moro, "
Peoples,	" "
Improved Rose,	" "
White Peach Blow,	" "
Early Eureka,	" "
Russett,	" "
Burbank,	" "
Gold Coin,	Redmond, "
Burbank,	Lowerbridge, "
Uncle Sam,	Bend, "
Netted Gem,	Redmond, "
Burbank,	" "
Uncle Sam,	" "
Uncle Sam,	Klamath, "
Netted Burbank,	" "

The work was done at the Oregon Agricultural College under the joint supervision of the Departments of Agronomy and Home Economics during the year 1915-1916.

OBJECT.

In undertaking this work it was realized at once that to be of value the procedure must follow closely the processes in use in the average home, and not attempt to make the best possible use of a variety that might be suggested by a knowledge of the principles of cookery, which is not available to the general housewife.

Therefore, with the foregoing facts in mind, the objects sought by the investigation were:

(a) To determine the relative value of certain varieties of potatoes, from a table standpoint when cooked in the following ways:

1. Boiled in the skin.
2. Boiled without the skin.
3. Mashed.
4. Baked.

(b) To make a comparison of varieties grown under different conditions of soil, altitude, and moisture.

(c) To determine which of the four methods of cooking used is best adapted to certain varieties.

(d) To establish, if possible, a relation between mealiness and flavor.

STANDARDS.

To have a basis for comparison, and to make clear certain distinctions to be noted later, the following brief description of the potato, taken largely from Dr. Langworthy's Bulletin (Farmers' No. 296) is given.

The potato is an enlarged stem used by the plant as a storage reservoir for its accumulated carbohydrate intended as nourishment

for the young plant.

It consists of four rather well defined areas, the outer skin or covering, a layer just beneath this varying in width from .12 to .5 of an inch, and known as the cortical layer, and an inner and outer medullary layer. In the cortical layer are found some of the minerals and most of the stored proteins (mainly a globulin, tuberoses, and a proteose), but the main part of the potato consists of the two interior or medullary layers, constituting about 89%.

Of these, the inner one or core contains less starch than the outer which in varieties scoring highest in table qualities consists of as high as 20% of starch.¹¹

The mealiness, which is the main factor in quality considered in this country, depends upon the amount of starch in each of these portions. To be mealy at all and not soggy a potato must contain at least 18% of starch, which should be distributed rather evenly throughout the tuber. In general, the standards accepted in this country call for a potato rich in starch and with a smooth surface. The eyes must not be large nor deeply indented, since this is a wasteful type when pared, and it is also popularly supposed that the number of eyes affect the flavor. The size should not exceed 4" x 3" and they should weigh about six or seven ounces. The shape desired differs in different localities, but in general the round and slightly oval types are preferred.

Bearing these general facts in mind, the following specific qualities were decided upon for furnishing the standards for judging:

¹¹ "The Potato", by Samuel Fraser.

For mealiness, a dry and floury product, free from wetness and with particles glistening as though crystalline.

Flavor, which while quite intangible as to description was always distinctly recognized and analyzed. The judges considered desirable a distinct mild flavor, associated in their minds with the name potato, and considered very undesirable any strong flavor associated with sunburn or greened potatoes, or any earthiness, as well as some of the strong flavors due to excess of some particular ingredient, or an insipid watery flavor.

Color.—A very light cream tinge was considered better than a perfect white, but any suggestion of dark color or spots of color was considered a fault. Texture was so often associated with mealiness that it was frequently a disputed point among the judges, but the general rule followed was that a potato perfect in texture should break readily when a fork is inserted, and should show an open, crumbly structure. Individual particles should be so dissociated that they do not pack together readily as in waxy or soggy potatoes. Potatoes sticky, waxy, or gummy in texture do not break open readily, and after cooking and upon opening assume a sad or heavy appearance and are not mealy and palatable. A perfect potato would be uniformly mealy, that is, have the starch uniformly distributed through all three layers and of a texture such that cutting through the boiled potato with a fork would not entirely do away with the crystalline appearance at the point of section.

It should be glistening, of a very light cream color, should have an agreeable taste with the distinct flavor associated with potato and leave in the mouth no strong or disagreeable sensation.

The following sample score card will show the percents given to each of these qualities:

	Mealiness	Flavor	Color	Texture	Remarks
	40%	30%	10%	20%	
Variety					
Boiled in Skin					
Boiled without Skin					
Mashed					
Baked					

Bearing in mind the procedure common in the average home, each sample of potatoes was divided into four lots, one of which was boiled in the skin, another boiled after being pared, another mashed, and another baked.

Uniformity in size, where possible, and always in amounts was aimed for.

Those to be baked were slightly coated with a fat (Crisco), to insure a more palatable product, with a skin that did not form a crust.

The apparatus used was that of the Domestic Science laboratory, and consisted of granite ware kettles for boiling, and tin plates for baking.

The potatoes were numbered and judged by number. There were usually three judges, Professor G. R. Hyslop representing the Agronomy Department of the Oregon Agricultural College, some one of the professors from the Domestic Science Department, and the writer.

At times there were additional judges, graduate students from the Department of Agronomy.

The following are sample score cards.

After judging, the variety name was placed upon the score card by the writer from a key kept for that purpose.

Table for Moro						
	Mealiness	Flavor	Color	Texture	Total Average	Totals
Burbank						
Boiled in Skin	38.00	29.00	8.50	18.00	93.5	
Boiled without Skin	37.00	29.00	9.00	17.00	92.00	
Mashed	34.00	27.00	7.50	16.50	85.00	
Baked	37.5	28.00	8.00	17.00	90.00	
Average	36.625	28.25	8.25	17.125	90.125	360.50
Netted Gem						
Boiled in Skin	37.50	26.50	9.50	17.75	91.75	
Boiled without Skin	33.75	23.75	8.75	17.40	83.65	
Mashed	37.00	24.50	9.00	18.00	88.50	
Baked	37.50	26.00	9.00	18.00	90.50	
Average	36.437	25.187	9.062	17.787	88.60	354.40
Improved Rose						
Boiled in Skin	35.50	26.00	8.50	17.50	87.50	
Boiled without Skin	35.00	27.00	8.00	16.50	86.50	
Mashed	33.50	27.00	8.50	16.00	85.00	
Baked	34.00	27.00	8.75	17.00	86.75	
Average	34.54	26.75	8.437	16.75	86.43	345.75
Gold Coin						
Boiled in Skin	31.00	25.00	8.00	15.50	79.50	
Boiled without Skin	32.00	29.00	7.50	16.00	80.50	
Mashed	39.00	21.00	10.00	18.00	88.00	
Baked	38.00	26.00	9.50	19.00	92.50	
Average	35.00	25.25	8.75	17.125	85.13	340.5
Early Eureka						
Boiled in Skin	33.00	25.75	8.25	16.75	87.75	
Boiled without Skin	28.75	25.00	6.75	14.00	74.25	
Mashed	33.00	27.75	8.25	16.50	85.50	
Baked	29.5	25.00	7.25	15.25	77.00	
Average	31.062	26.625	7.625	15.625	81.12	324.50
White Peach Blow						
Boiled in Skin	32.50	24.50	7.75	15.25	80.00	
Boiled without Skin	29.00	22.50	7.50	14.50	68.50	
Mashed	31.00	23.50	7.75	14.25	76.50	
Baked	29.00	22.50	6.75	13.50	71.75	
Average	30.375	23.25	7.437	14.375	74.18	324.50

Peoples	Mealiness	Flavor	Color	Texture	Total Average	Totals
Boiled in Skin	30.50	22.50	7.75	14.00	74.75	
Boiled without Skin	25.00	20.25	6.25	12.50	64.00	
Mashed	31.25	19.50	7.50	14.50	72.75	
Baked	22.50	19.50	6.00	12.00	60.00	
Average	27.312	20.437	6.875	13.25	67.87	271.50

Willamette Valley.

Burbank (New Era)

Boiled in Skin	39.50	26.00	9.00	19.00	93.50	
Boiled without Skin	38.00	29.50	8.50	19.00	95.00	
Mashed	36.00	28.50	8.00	16.00	88.50	
Baked	39.00	27.00	9.00	19.50	94.00	
Average	38.125	27.75	8.625	18.375	92.88	371.50

Burbank (St. Paul)

Boiled in Skin	37.00	22.00	6.00	18.00	83.00	
Boiled without Skin	35.00	23.00	6.00	18.50	82.50	
Mashed	39.00	28.50	8.50	19.00	94.50	
Baked	37.00	24.00	7.00	15.00	83.00	
Average	37.00	24.375	6.875	17.625	85.75	343.00

Sir Walter Raleigh (Corvallis)

Boiled in Skin	30.00	22.50	8.00	12.50	73.00	
Boiled without Skin						
Mashed	36.00	26.00	8.50	17.00	87.50	
Baked	37.5	24.00	8.00	18.00	87.50	
Average	34.5	24.166	8.166	15.833	82.66	248.00

Carmen (Corvallis)

Boiled in Skin	28.00	25.00	7.50	16.00	76.50	
Boiled without Skin	30.00	20.50	8.00	16.00	74.50	
Mashed	34.50	25.00	6.00	16.00	81.50	
Baked	38.00	29.00	9.00	18.00	94.00	
Average	32.625	24.875	7.625	16.50	81.63	326.50

Sir Walter Raleigh (Sherwood)

Boiled in Skin	30.00	28.00	6.50	14.66	78.83	
Boiled without Skin	29.33	29.66	7.66	16.33	86.00	
Mashed	34.50	26.26	7.50	16.33	85.50	
Baked	33.66	25.83	7.16	15.50	82.16	
Average	31.875	27.437	7.25	15.705	81.46	325.83

Peach Blow (Corvallis)

Boiled in Skin	35.00	27.00	8.30	19.00	89.30	
Boiled without Skin	28.00	22.00	6.50	14.00	70.50	
Mashed	33.50	26.00	7.00	17.00	83.50	
Baked	33.00	20.50	7.50	16.00	77.00	
Average	32.375	23.875	7.575	16.50	80.07	320.30

	Mealiness	Flavor	Color	Texture	Total Average	Totals
Pingree (Corvallis)						
Boiled in Skin	28.00	19.00	8.50	15.00	70.00	
Boiled without Skin						
Mashed	30.00	22.00	6.50	16.00	74.50	
Baked	35.00	28.00	8.50	17.00	88.50	
Average	31.00	23.00	7.66	16.60	77.66	233.00
American Wonder(New Era)						
Boiled in Skin	28.00	22.00	7.00	15.00	72.00	
Boiled without Skin	30.00	23.00	7.00	16.00	76.00	
Mashed	32.00	27.00	8.00	17.00	84.00	
Baked	32.00	22.00	8.00	16.00	78.00	
Average	30.50	23.50	7.50	16.00	77.50	310.00
Pearl (Corvallis)						
Boiled in Skin	20.00	20.00	6.00	10.00	56.00	
Boiled without Skin						
Mashed	34.00	23.00	8.00	15.00	80.00	
Baked	34.00	27.00	7.00	15.50	83.5	
Average	29.33	23.33	7.00	13.5	73.16	219.5
Uncle Sam (Klamath)						
	Klamath					
Boiled in Skin	32.00	24.5	7.5	15.00	79.00	
Boiled without Skin	32.00	26.25	6.75	16.00	81.00	
Mashed	33.50	26.75	8.75	17.00	85.5	
Baked	32.50	26.00	8.75	16.00	83.25	
Average	32.50	25.875	7.937	16.00	82.18	328.75
Netted Gem						
Boiled in Skin	25.50	24.00	8.00	12.50	70.00	
Boiled without Skin	30.00	24.00	7.00	16.00	77.00	
Mashed	32.00	22.00	10.00	15.00	79.00	
Baked	30.00	21.00	7.50	15.00	73.5	
Average	29.375	25.50	8.25	14.65	74.88	299.50
Crook County						
Burbank (Redmond)						
Boiled in Skin	39.50	26.00	10.00	20.00	97.50	
Boiled without Skin	38.00	29.50	9.50	18.50	95.50	
Mashed	38.00	28.50	9.50	18.00	89.50	
Baked	38.00	27.00	9.00	18.00	92.00	
Average	38.325	27.75	9.50	18.625	93.625	374.50
Uncle Sam (Redmond)						
Boiled in Skin	37.00	27.50	10.00	19.50	96.00	
Boiled without Skin	40.00	27.00	10.00	19.50	96.50	
Mashed	39.00	25.00	10.00	19.00	93.00	
Baked	33.50	25.00	8.50	16.00	83.00	
Average	37.775	26.15	9.625	18.50	92.625	368.50

	Mealiness	Flavor	Color	Texture	Total Average	Totals
Gold Coin (Redmond)						
Boiled in Skin	37.50	28.00	9.00	19.00	93.50	
Boiled without Skin	39.50	27.00	10.00	20.00	96.50	
Mashed	36.00	25.00	9.50	18.00	88.50	
Baked	36.50	25.00	7.50	16.00	88.00	
Average	37.50	26.25	9.00	18.25	91.625	366.50
Burbank (Lowebridge)						
Boiled in Skin	36.75	26.00	8.25	18.50	89.50	
Boiled without Skin	39.00	26.00	9.25	19.00	93.25	
Mashed	37.50	25.25	8.50	16.75	88.00	
Baked	36.50	25.25	8.75	17.50	88.00	
Average	37.437	25.625	8.687	17.937	89.68	358.75
Netted Gem (Redmond)						
Boiled in Skin	35.00	25.50	7.50	17.00	85.00	
Boiled without Skin	35.00	22.00	8.00	17.00	82.00	
Mashed	35.00	25.00	9.00	18.00	87.00	
Baked	29.00	24.00	9.00	15.00	77.00	
Average	33.50	24.125	8.375	16.75	82.75	331.00
Uncle Sam (Bend)						
Boiled in Skin	28.00	20.00	6.00	14.00	68.00	
Boiled without Skin	32.00	17.00	7.50	15.00	71.50	
Mashed	37.50	22.00	6.50	16.00	82.00	
Baked	31.00	21.00	7.50	16.00	75.50	
Average	32.125	20.00	6.875	15.25	74.25	297.00

CAUSES OF EXPERIMENTAL ERRORS.

Although reasonable care was exercised in carrying on the investigations, some causes of errors that could not be avoided undoubtedly influenced these results.

The potatoes necessarily were not all at their best, as some of those judged late in the semester had begun to sprout and these, of course, would not score as high for mealiness as they would have done earlier in the season, as it is a well known fact that the starch content changes after potatoes have reached the stage of sprouting.

Then, while the standards were uniform, the individuals acting as judges differed from time to time owing to the fact that the ex-

periments had to be judged as soon as performed, and as no one of the Domestic Science professors could at all times be at leisure, several different ones were called upon to undertake this task.

The following description of the varieties tested is taken from Bulletin No. 176, Bureau of Plant Industry, U. S. Department of Agriculture. 1. American Wonder.—Tubers large, uniform in size, elongated, slightly compressed, eyes few and nearly flush with surface, skin white. Approaches very close to a blight and rot-proof potato. Seedling of Wall's Orange. Late variety.

2. Burbank.—Medium late. Has few eyes and these are sunk but little below the surface, is white skinned, fine grained and mealy.

—Note—Most Burbanks, however, possess a relatively large number of eyes.

3. Carmen No. 3.—Season late. Tubers oblong, flattened, shapely and smooth; eyes few; skin flesh colored, flesh white.

4. Early Eureka.—Extra early maturing. Tubers broad, shortened, oblong, thick; eyes few, shallow; skin smooth, and of a pure white.

—Note—The above description answers every requirement of the "Irish Cobler", and it would appear that they are identical.

5. Early Rose (Improved).—Early maturing. Tubers smooth, and nearly cylindrical, varying to flattish at the center, tapering gradually toward each end. Eyes shallow, but sharp and strongly marked; skin thin, tough, of a dull blush color; flesh solid, brittle, rarely hollow.

6. Gold Coin.—Tubers slightly oblong, rather broad, quite thick, ends slightly rounded; eyes small; skin thin, smooth and glossy, and of a light golden tint; flesh pearly white.

7. Netted Gem.—Similar to Burbank and with a somewhat thickened, reticulated corky skin.

8. Pingree.—Matures early. Tubers very smooth and regular; eyes few and shallow; skin white with a thick netting, similar to Burbank.

9. Pearl.—Medium early. Tubers medium to large size, round, flattened to heart shape, flattened, usually heavily shouldered and broader at stem end; eyes rather shallow, sometime protuberant when over-developed; in normal condition the bud-eye cluster is shallow; when freshly dug there is a distinct pinkish or light purple tinge around the eyes, particularly at the seed end, but after exposure to the light or after prolonged storage this color is not so noticeable; skin a dull white or light russet or brownish-white, usually roughened or crackled; flesh solid and quite heavy; a late variety.

10. Peach Blow.—Late maturing tubers that are smooth, red skinned and have a creamy yellow flesh. The stem end is depressed and the eyes are few.

11. Peoples.—Tubers oblong to oval, rather large. The eyes are few and rather shallow; the skin russet to white, sometimes splashed with pink. The flesh is solid and quite heavy. A late variety of the Pearl type.

12. Sir Walter Raleigh.—Season medium late. Tubers are oblong to round; flattened; eyes few and shallow; skin pure white, and netted; flesh white.

13. Uncle Sam.—Season medium late. Tubers are oval; eyes shallow; skin russet white.

Table Showing Scores of Above

Variety	Region	Mealiness
Burbank	Moro	36.625
Netted Gem	"	36.437
Gold Coin	"	35

Variety	Region	Mealiness
Improved Rose	Moro	34.54
Early Eureka	"	31.062
White Peach Blow	"	30.375
Peoples	"	27.312
Burbank (New Era)	Willamette Valley	38.125
Burbank (St. Paul)	" "	37.
Sir Walter Raleigh (Corvallis)	" "	34.5
Carmen "	" "	32.625
Peach Blow "	" "	32.375
Sir Walter Raleigh (Sherwood)	" "	31.875
Pingree (Corvallis)	" "	31
American Wonder (New Era)	" "	30.5
Pearl (Corvallis)	" "	29.33
Uncle Sam	Klamath	32.5
Netted Gem		29.375
Burbank (Redmond)	Crook County	38.325
Uncle Sam "	" "	37.775
Burbank (Lowerbridge)	" "	37.437
Gold Coin (Redmond)	" "	37.375
Netted Gem "	" "	33.5
Uncle Sam (Bend)	" "	32.125

Variety	Region	Color
Netted Gem	Moro	9.062
Gold Coin	"	8.75
Improved Rose	"	8.437
Burbank	"	8.25
Early Eureka	"	7.625
White Peach Blow	"	7.437
Peoples	"	6.875
Burbank (New Era)	Willamette Valley	8.625
Sir Walter Raleigh (Corvallis)	" "	8.166
Pingree "	" "	7.66
Carmen "	" "	7.625
Peach Blow "	" "	7.575
American Wonder (New Era)	" "	7.50
Sir Walter Raleigh (Sherwood)	" "	7.25
Pearl (Corvallis)	" "	7.00
Burbank (St. Paul)	" "	6.875
Netted Gem (Klamath)	Klamath	8.25
Uncle Sam "	"	7.937
Uncle Sam (Redmond)	Crook County	9.625
Burbank "	" "	9.5
Gold Coin "	" "	9.00
Burbank (Lowerbridge)	" "	8.687
Netted Gem (Redmond)	" "	8.375
Uncle Sam (Bend)	" "	6.875

Variety	Region	Flavor
Burbank	Moro	28.25
Improved Rose	"	26.75
Early Eureka	"	26.625
Gold Coin	"	25.25
Netted Gem	"	25.187
White Peach Blow	"	23.25
Peoples	"	20.437
Burbank (New Era)	Willamette Valley	27.75
Sir Walter Raleigh (Sherwood)	" "	27.437
Carmen (Corvallis)	" "	24.875
Burbank (St. Paul)	" "	24.375
Sir Walter Raleigh (Corvallis)	" "	24.166
Peach Blow "	" "	23.875
American Wonder (New Era)	" "	23.50
Pearl (Corvallis)	" "	23.33
Pingree	" "	23
Uncle Sam (Klamath)	Klamath	25.875
Netted Gem "	"	25.5
Burbank (Redmond)	Crook County	27.75
Gold Coin "	" "	26.25
Uncle Sam "	" "	26.15
Burbank (Lowerbridge)	" "	25.625
Netted Gem (Redmond)	" "	24.125
Uncle Sam (Bend)	" "	20

Variety	Region	Texture
Netted Gem	Moro	17.787
Burbank	"	17.125
Gold Coin	"	17.125
Improved Rose	"	16.75
Early Eureka	"	15.625
White Peach Blow	"	14.375
Peoples	"	13.25
Burbank (New Era)	Willamette Valley	18.375
Burbank (St. Paul)	" "	17.625
Peach Blow (Corvallis)	" "	16.5
Carmen "	" "	16.5
American Wonder (New Era)	" "	16
Pingree (Corvallis)	" "	16
Sir Walter Raleigh (Corvallis)	" "	15.833
Sir Walter Raleigh (Sherwood)	" "	15.705
Pearl (Corvallis)	" "	13.50
Uncle Sam (Klamath)	Klamath	16
Netted Gem	"	14.65
Burbank (Redmond)	Crook County	18.625
Uncle Sam "	" "	18.5
Gold Coin "	" "	18.25
Burbank (Lowerbridge)	" "	17.937
Netted Gem (Redmond)	" "	16.75
Uncle Sam (Bend)	" "	15.25

	Elevation	Irrigation	Mealiness	Flavor	Color	Texture	Average
Crook Co.	3,500 ft.	Irrigated	36.089	24.65	8.677	17.552	87.427
Moro	2,000 "	None	33.044	25.107	8.062	16.005	82.218
Willamette Valley	-500 "	Humid	33.703	24.70	7.586	16.226	81.474
Klamath	4,000 "	Irrigated	30.937	25.687	8.093	15.325	78.515

The following table gives the scores arranged by groupes.

Varieties	Region	Elevation	Irrigation	Mealiness	Flavor	Color	Texture	Average
Sir Walter	Sherwood							
Raleigh	-500	Humid	31.875	24.437	7.25	15.705	}	81.46
" "	Corvallis							
" "	-500	"	34.5	24.166	8.166	15.833		82.66
								Rural
Carmen	"	"	32.625	24.875	7.625	16.5	}	81.63
Average			33	25.493	7.68	16.013		
								81.917
	Redmond							
Uncle Sam	3,500	Irrigated	37.775	26.15	9.625	18.5	}	92.625
Gold Coin	"	"	37.375	26.25	9.00	18.25		
	Bend							Green
Uncle Sam	3,500	"	32.125	20.00	6.875	15.25	}	74.25
" "	Klamath							
" "	4,000	"	32.5	25.875	7.937	16.00		82.15
	New Era							Group
American Wonder	-500	Humid	30.5	23.50	7.50	16.00	}	77.50
	Moro							
Gold Coin	2,000	Dry	35.0	25.25	8.73	17.125		85.13
Average			34.712	24.504	8.281	16.854		83.88
Pearl	Corvallis						}	73.16
	-500	Humid	29.33	23.33	7.00	13.50		
Peoples	Moro							Pearl
	2,000	Dry	27.312	20.437	6.875	13.25	}	67.88
Average			28.321	21.883	6.937	13.375		
								Group
Peach Blow	Corvallis						}	80.07
	-500	Humid	32.375	23.875	7.575	16.50		
White Peach	Moro							Peach
Blow	2,000	Dry	30.375	23.25	7.487	14.375	}	75.25
Average			31.375	23.562	7.531	15.437		Group
								77.66

Variety	Region Elevation	Irrigation	Mealiness	Flavor	Color	Texture	Average
Improved Rose	Moro 2,000	Dry	34.50	26.75	8.437	16.75	86.44 Rose Group
Burbank	Moro 2,000	Dry	36.625	28.25	8.25	17.125	90.125
Netted Gem	"	"	36.437	25.187	9.062	17.787	88.48
Burbank	St. Paul -500	Humid	37.00	24.375	6.875	17.625	85.75
"	New Era -500	"	38.125	27.75	8.625	18.375	92.88
Pingree	Corvallis -500	"	31.00	23.00	7.66	16.00	77.66
Netted Gem	Klamath 4,000	Irrigated	29.375	25.50	8.25	14.65	74.88 Burbank Group
Burbank	Lowerbridge 3,500	"	37.437	25.625	8.687	17.937	89.69
Netted Gem	Redmond 3,500	"	33.50	24.125	8.375	16.75	82.75
Burbank	Redmond 3,500		38.325	27.75	9.50	18.625	93.625
Average			35.313	25.729	8.364	17.208	86.203
Early Eureka	Moro 2,000	Dry	31.062	26.625	7.625	15.625	80.113 Irish Cobler Group

Summary of Groups.

Improved Rose	Average of	1	86.44
Burbank Group	"	9	86.203
Green Mountain Group	"	6	83.88
Rural Group	"	3	81.917
Irish Cobler Group	"	1	80.113
Peach Blow	"	2	77.66
Pearl	"	2	70.52

In order to establish the varieties scoring highest by each particular method of cooking, the following tables were made out. Those which scored 85 or above were selected as being desirable when prepared for the table in a particular manner.

Those scoring 85 or above when boiled in the skin were:

Variety	Region where grown	Score
Burbank	Redmond	97.5

Variety	Region where grown	Score
Uncle Sam	Redmond	96
Gold Coin	"	93.5
Burbank	Moro	93.5
Burbank	New Era	93.5
Netted Gem	Moro	90.75
Burbank	Lowerbridge	89.5
Peach Blow	Corvallis	89.3
Improved Rose	Moro	88
Netted Gem	Redmond	85

Summarizing this table shows that 30% came from Moro, 20% from the Willamette Valley, and 50% from Crook County. Also that 60% are members of the Burbank Group, 20% of the Green Mountain, and 10% of the Rose Group, and 10% of the Peach Blow.

	No. of Samples	%	Total %
Burbank Group			
Burbank	4	40	
Netted Gem	2	20	60%
Green Mountain Group			
Uncle Sam	1	10	
Gold Coin	1	10	20%
Rose Group			
Improved Rose	1	10	10%
Peach Blow Group			
Peach Blow	1	10	10%

Those scoring 85 or above after paring were:

Variety	Region where grown	Score
Uncle Sam	Redmond	96.5
Gold Coin	"	96.5
Burbank	"	95.5
Burbank	New Era	95
Burbank	Lowerbridge	93.25
Burbank	Moro	92
Improved Rose	"	86.5
Sir Walter Raleigh	Sherwood	86

Summary

From Moro		25%
From Willamette Valley		25%
From Crook County		50%
Burbank Group		4
	) Uncle Sam	1
Green Mountain Group		25%
	) Gold Coin	1
Rose Group		1
Rural Group		1
(Sir Walter Raleigh)		12.5%
		12.5

The following table shows the results when the potatoes were prepared as mashed potatoes, that is, mashed and seasoned while hot:

Variety	Region where grown	Score
Burbank	Saint Paul	94.5
Uncle Sam	Redmond	93
Burbank	"	89.5
Netted Gem	Moro	88.5
Burbank	New Era	88.5
Gold Coin	Redmond	88.5
Gold Coin	Moro	88
Burbank	Lowerbridge	88
Sir Walter Raleigh	Corvallis	87.5
Netted Gem	Redmond	87
Early Eureka	Moro	85.5
Uncle Sam	Klamath	85.5
Sir Walter Raleigh	Sherwood	85
Improved Rose	Moro	85
Burbank	"	85

Summary

From Moro		33.3%
From Willamette Valley		26.6%
From Crook County		33.3%
From Klamath		06.6%
	Groups	
Burbank Group	) Burbank	5
	) Netted Gem	2
Green Mountain Group	) Gold Coin	2
	) Uncle Sam	2
Rose Group	Rose	1
Rural Group	Sir Walter Raleigh	2
Irish Cobbler Group	Early Eureka	1
		46.6%
		26.6%
		06.6%
		13.3%
		06.6%

The following table shows those scoring 85 or above when baked:

Variety	Region where grown	Score
Burbank	New Era	94.5
Carmen	Corvallis	94
Gold Coin	Moro	92.5
Burbank	Redmond	92
Netted Gem	Moro	90.5
Burbank	"	90
Pingree	Corvallis	88.5
Gold Coin	Redmond	88
Burbank	Lowerbridge	88
Sir Walter Raleigh	Corvallis	87.5
Improved Rose	Moro	86.75
Uncle Sam	Redmond	85

Summary

From Moro	33.3%
From Willamette Valley	33.3%
From Crook County	33.3%

Groups

Burbank Group) Burbank	4	50%
	) Pingree	1
	) Netted Gem	1
Green Mountain Group) Gold Coin	2	25%
	) Uncle Sam	1
Rose Group	Improved Rose		8.3%
Rural Group) Carmen	1	16.6%
	) Sir Walter	
	) Raleigh	1

The following table gives the averages of all the methods of preparing the potatoes for the different qualities, and was obtained by averaging the scores of each variety. It shows, in general, the potatoes best in all respects:

Variety	Region where grown	Score
Burbank	Moro	96.125
Burbank	Redmond	93.625
Burbank	New Era	92.875

Variety	Region where grown	Score
Uncle Sam	Redmond	92.625
Gold Coin	"	91.625
Burbank	Lowerbridge	89.69
Netted Gem	Moro	88.48
Improved Rose	"	86.44
Burbank	St. Paul	85.75
Gold Coin	Moro	85.13

Summary

From Moro	40%
From Willamette Valley	20%
From Crook County	40%

Groups

Burbank Group	) Burbank	5	60%
	) Netted Gem	1	
Green Mountain Group	) Gold Coin	2	30%
	) Uncle Sam	1	
Rose Group	Improved Rose	1	10%

As seen from the above table, a greater number of varieties scored above 85 when served as "mashed potatoes" than when cooked by any other method, fifteen varieties so scoring.

"Baked potatoes" proved next most popular with the judges, twelve being ranked well above 85 when thus prepared.

Ten varieties scored 85 or above when boiled in the skin, while only eight were ranked as high as 85 when the skin was removed before cooking.

This would indicate that a poor potato may be made more palatable by being mashed and seasoned than when served in any of the other three ways. And, although the paring of the potato removes most of the protein and valuable mineral salts, these in the average dietary are made up by the use of protein foods and other vegetables richer in ash than is the potato.

To ascertain what relation existed between these scores and the conditions under which the potatoes were grown, the following tables were prepared:

Moro

Elevation	2,000 ft. (Approximately)
Soil	Silt Loam.
Irrigation	None

Willamette Valley

Elevation	Less than 500 feet.
Soil	Beaver dam and sandy loam.
Irrigation	None

Crook County

Elevation	3,500 ft. (Approximately).
Soil	Silt or sandy loam.
Irrigation	Yes.

The following table shows the percent of varieties scoring 85 or above in relation to the question of irrigation during growth:

Without Irrigation.

	Best for all methods	Best cooked in skins	Best cooked without skins	Best Mashed	Best Baked
Moro	40%	30%	25%	33.3%	33.3%
Willamette Valley	40%	20%	25%	26.6%	33.3%

With Irrigation

Klamath				6.6%	
Crook County	20%	50%	50%	33.3%	33.3%

A comparison of these tables gives very little definite information on the subject of the effect of irrigation and doubtless covers too small a number of samples to be of any value. The data concerning altitude was too indefinite to enter into consideration at all.

Table showing relations between flavor and mealiness:

Varieties		Mealiness	Flavor	Ratio
Burbank	Redmond	38.325	27.75	1:71
"	New Era	38.125	27.75	1:72
Uncle Sam	Redmond	37.775	26.15	1:69
Burbank	Lowerbridge	37.437	25.625	1:66
Gold Coin	Redmond	37.375	26.25	1:70
Burbank	St. Paul	37	24.375	1:65
Burbank	More	36.625	28.25	1:77
Netted Gem	"	36.437	25.187	1:68
Gold Coin	"	35	25.25	1:72

From the above table of those scoring 85 or above for general qualities, it is seen that there is no definite relation between mealiness and flavor, as is popularly supposed.

The flavor, good or bad, was often a difficult point for the judges to decide upon, and a reference to the table of scores will show that a potato scoring high for mealiness did not always have a pleasing flavor, and also that often a potato that was soggy had a good flavor.

GENERAL SUMMARY

During the course of this investigation the following facts were brought out:

- I. That the cooking quality of potatoes does not depend upon one factor alone, but is evidently a product of several.
- II. That different varieties of potatoes must be cooked in different ways to bring about the best results for each.
- III. That mealiness, and therefore starch content, is the large factor in determining value.
- IV. That different methods of cooking give widely different results with the same potato. Therefore it is necessary to know the best method of cooking a given variety.

V. That mashing and seasoning cover up defects in a rather poor potato, and is consequently a method of making palatable a potato that otherwise might be quite unacceptable.

VI. Quality in potatoes is evidently influenced by irrigation but little, those grown without irrigation proving only a trifle better than those grown under irrigation.

VII. That there is no clearly defined relation existing between mealiness and flavor.

VIII. That shape and eye structure are large factors in the economy of potatoes.

IX. That the Burbank is a particularly good variety for this part of the country.

X. That individual varieties in a group give similar scores.

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Plate I.

- I. Netted Gem
- II. Vermont Gold Coin
- III. American Wonder

Redmond
"
New Era



Plate II.

- I. Sir Walter Raleigh
- II. Uncle Sam
- III. Peoples

Sherwood
Klamath
Moro



Plate III.

- I. Sir Walter Raleigh
- II. Uncle Sam
- III. Peoples



Plate IV.

- I. Burbank
- II. Early Eureka