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FURTHER WORK ON THE MATURITY OF AVOCADOS

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The work reported to your Association this year consists of the results of the systematic analysis of monthly samples of the fruit of the eight varieties of avocados recommended for commercial planting by the Association at the time the work was started. The data are fairly complete in all but a few cases. Wind storms, theft of fruit and the difficulty of locating a satisfactory tree for sampling have reduced the number of samples in a few varieties. The purpose of the work is to ascertain whether or not maturity of the fruit can be judged from these analyses.

Methods of Sampling

The trees used for sampling were as follows: A Fuerte at Yorba Linda, a Taft at Yorba Linda, a Sharpless at Tustin, a Lyon at Whittier, a Dickinson at Chula Vista, a Spinks at Duarte, a Puebla at San Fernando and a Blakeman at Altadena. It would have been better for the purpose of the investigation if all the trees could have been located in one planting, or at least in one district. At this time, however, this condition was impossible of attainment. The numbers of trees are yet too few to permit of any great latitude in the selection of locations, so that the results must be studied with this fact in mind. Practically all of the trees used were young, strong growing specimens, bearing 25 to 75 fruits. Monthly samples of fruit consisting of from 2 to 6 avocados were taken.

When these samples were received at the laboratory, one half of the number taken were analyzed at once; the other half were carefully wrapped in paper, laid aside until the flesh had softened satisfactorily, and then subjected to analysis. If for any reason, either analysis had to be delayed, the samples were kept in cool storage (from 35 to 45° F.) until used. In the text, the samples analyzed at once are referred to as hard samples, while those not analyzed until they had softened are called soft samples.

In preparing them for analysis, the fruits were weighed first in air and then under water, and the specific gravity calculated. They were then halved, the seed carefully removed and the flesh scraped from the skin with a spoon. In the case of immature fruit, where the analyses were made before the flesh had softened, this separation was very difficult and in a great majority of cases, the skin was removed by paring with a knife. The skin, seed and flesh were each weighed and their proportion calculated.

The flesh of the fruits was finely ground by passing through a food grinder repeatedly, and the following determinations were made upon it: Water, ash, protein, fat, sugar and crude fiber. The methods of the Association of Official Agricultural Chemists were used

and need not be further described, except to say that water was determined by mixing the pulp with asbestos fiber and drying in vacuo at 70°C.

Significance of the Determinations Made

The specific gravity of the fruit chiefly indicates its texture or compactness. Avocados with loose seeds and hollow centers have a low specific gravity.

The moisture which the fruit contains is not indicative of its quality as far as our observations go; green fruit contains more water than ripe, for, as the proportion of fat increases, the proportion of water decreases.

So far as the study of maturity goes, ash is a relatively unimportant constituent of the avocado. It has, however, some importance when food values are considered. Protein is a very important food material and occurs in unusual quantities for a fruit, but does not vary greatly as the avocado matures.

Fat is the characteristic constituent to which the fruit owes its popularity. It must not be thought, however, that fat alone is the determining factor in the quality of a variety. The amount of this constituent increases rapidly as the fruit matures, and affords one basis for the study of the maturity.

Sugar is relatively not important, but is extremely interesting both on account of its constitution and its disappearance as the fruit matures.

Tables I to IX

Discussion of the Data

The data derived from the analysis of the samples are presented in nine tables. For better comparison, the hard samples and soft samples picked at the same time are grouped in the tables. In order to better compare the varieties, a table is also given showing the composition of each variety at the time of its maximum fat content. The results in this table are from the fruit that had been stored until soft. A figure is also given which illustrates the changes in fat content of each variety as it matures.

A discussion of the data naturally divided into two phases: first, a comparison of the composition of the varieties, and secondly, a discussion of the time of maturity of each.

Composition of Varieties

In comparing the varieties, it is hardly fair to take the averages of all the samples examined, as where the trees contained a large number of fruits, the analyses were started earlier in the season than where the fruit was scarce. The averages from fruit of these trees would for this reason be lower than where the work began later in the season. Neither is it thought best to compare only the data obtained from samples which we judged to be commercially mature, as this to some extent would be a matter of personal opinion. If, however, the data for comparison are taken at the time of maximum fat content of each variety, then each will be thoroughly mature and probably

at its best.

Table X

Summarizing the data given in the first eight tables, we find:

In weight, the varieties ranked as follows, when considered with regard to size alone: Sharpless, Spinks, Blakeman, Lyon and Fuerte, Taft, Dickinson and Puebla. The ranks were not changed when the heaviest samples only were considered. The Sharpless samples ranged close to a pound and a quarter to one and a half. The Spinks ran very close to a pound each, as did the Blakeman samples. The Lyon and Fuerte samples were about the same size, varying around thirteen ounces, although both varieties reached a pound in size at times. The Taft and the Dickinson were only slightly smaller than the Fuerte and the Lyon, and both at times also reached a pound in size. The Puebla samples with one exception were less than half a pound in size.

In percentage of edible matter or pulp, the Fuerte and the Sharpless outrank the other varieties, both having about 80%, and both having a maximum close to 85%. The Lyon, the Blakeman, the Puebla, the Spinks and the Taft average above 70%, while the Dickinson, owing largely to its thick skin, has but 65%.

The Puebla and the Fuerte both have very thin skins, less than 7%. The Blakeman, the Spinks and the Sharpless are next in rank, having less than 10%, while the Taft and the Lyon are slightly above that amount. The Dickinson has close to 20% of its weight in skin.

The Sharpless, the Fuerte and the Dickinson have smaller seeds than the other varieties, averaging between 10% and 13%. The Lyon, the Blakeman and the Taft average from 15% to 17% seed, while the Spinks runs close to 20% and the Puebla slightly above that figure.

The Lyon, when mature, contains considerbly more protein than any of the other varieties, averaging above 2.50% and having a maximum of over 4%. The Spinks, the Puebla, the Fuerte and the Blakeman when mature contain over 2.00%, while the Sharpless, the Dickinson and the Taft are below that figure.

The Fuerte ranks first in oil content, having a maximum of nearly 30%. The Lyon and the Puebla both have over 25%, while the Blakeman is slightly over 20%. The Taft, the Spinks and the Sharpless have between 18% and 20% fat, and the Dickinson below 15%.

The Taft has less fiber than the others, averaging less than 1.00%; the Sharpless, the Spinks and the Lyon have between 1.00% and 1.25%. The Blakeman, the Dickinson, the Puebla and the Fuerte average between 1.25 % and 1.50%,

Discussion of the Time of Maturity of the Varieties

In order to better study the time of maturity, a figure showing the change in fat content has been arranged. A glance at this figure will reveal the fact that the fat content of the avocado increases rapidly as the fruit matures; that after the fruit is matured, the

increase is very slight, and that at times there is even an apparent decrease. Decreases, however, are slight and it is probable that they are due to individual variation.

Considering the graphs of the different varieties, it is seen that the rapid increase in fat in the case of the Fuerte ceases in December. For the three months ending at that time the increase in fat had been approximately 17%, while for the next four months it increased but 2%. From our notes made at the time of analysis, we find that in November, we were doubtful of the maturity of the sample, but in December, the samples had "the general appearance of being mature." It should be remembered that the samples came from a very favorable location at Yorba Linda.

Unfortunately in the case of the Puebla tree, the wind storms and pilfering had reduced the number of fruits to such an extent that the samples were exhausted in March. From the analytical data, however, it would seem that the increase in fat ceased in February, for the March sample shows a slight decrease. Up to this time, the increase had been steady, rising 17% in four months. Other indications point to the fact that the fruit was not quite mature in December, but had reached maturity at the time the February sample was taken, on the sixth of the month.

The Lyon sample reached the maximum content of fat in May. From October to May, seven months, there had been an average monthly increase of 3% in fat content. After May the samples show slight variation in fat, but no increase over the May sample. From other indications from the analyses and notes, it would appear that the fruit from this location was mature in April, at which time the stored sample contained 23% of fat.

Unfortunately the Blakeman fruits were removed from the tree before the sampling had been finished, and the data are incomplete. The samples were still increasing in fat when the last one was picked in May. The fruit from this location was not mature in February. There are some indications, however, that it might possibly have been satisfactory to market in March, and there seems little doubt that the May sample was satisfactory.

The work on the Spinks variety began well in December, but no further samples could be secured until March. Later in the season, the remaining fruit on the experimental tree was stolen, so that the July, August and September samples were from a neighboring tree. The only conclusions which can be drawn from the data are that the fruit from this location was not mature in December, but was fairly so in March when the next sample was taken. Other indications also point to maturity at this time.

The sampling of the Taft began earlier than was really necessary, but was carried out until no doubt of the maturity of the fruit could be entertained. The maximum fat content was reached in May after which there was a sharp decline in the sample taken in June. Indications are that the fruit was fairly mature in April.

Sampling on the Sharpless began in April, but it would have been more satisfactory to have begun earlier. The maximum fat content was reached in May and other indications pointed to the fact that the fruit was commercially mature the first month the sample was taken. The sampling was continued until September, and at that time there had been little if any lowering of the fat content or quality of the fruit.

Again in the case of the Dickinson samples, the fruit was stolen from the tree before the sampling was finished. The fat had increased 3% in the time elapsing between the May and June samples. From other data, it would seem that the fruit was mature at the time this sample was taken.

Examination of the tables does not reveal any other changes during growth that are nearly so uniform or marked as that of the fat. Probably the next most striking change is in the sugar content. There is always less sugar in the mature fruits than in the green. At best, of course, the fruits contain but little sugar, so that the changes are less uniform than with the fat.

With most of the varieties, there is also a slight increase in protein as the fruit matures. This is of course more noticeable where the sampling began early in the season and continued until the fruit was fully matured.

Moisture of course decreases as fat increases, and there is also a slight rise in the proportion of edible matter as the fruits mature, the proportion of skin and seed usually becoming smaller.

Miscellaneous Samples

Six miscellaneous samples have been examined since the last report was made to the Association. Four of these were from seedling trees raised by Mr. Oakley and are deserving of attention owing to the fact that they apparently mature at a time when many of the other varieties are not available. With the exception of No. 4, the fruits averaged close to a pound each, and with the exception of No. 2 contained a satisfactory amount of fat. Sample No. 1 was probably mature at the time of analysis in September, but the data on No. 2 would be in better shape if another sample had been taken a little later in the season. The seed in No. 3 had started to sprout and the fat content of No. 4 would seem to indicate maturity. Nos. 1, 3 and 4 are high in protein. The per cent of edible matter in No. 3 was also higher than is usually found.

Mr. Hoff of Hollywood also sent a seedling about 14 ounces in weight and containing 18½% of fat with 2¼% of protein.

An analysis of one of the Department of Agriculture's Guatemalan importations grown by Mr. Sheddon of Monrovia is also shown in the miscellaneous table. This variety is the Kanola, S. P. I. No. 43560. The fruit is small, round in shape, weighing about 8 ounces, and having a very heavy skin. The fat content is satisfactory but the fruit is decidedly deficient in protein.

In closing, I might say that the Laboratory stands ready to assist with analyses of new varieties, and it is suggested that its facilities be used for the study of their composition before they are made standard. It is especially desired to secure samples of the Department of Agriculture importations for analyses. Where new and promising varieties are to be sampled, it is preferable to make an appointment so that some one from the laboratory can see the fruit on the tree and take such notes as are necessary.

FIGURE 1

Monthly Variations in Fat Content

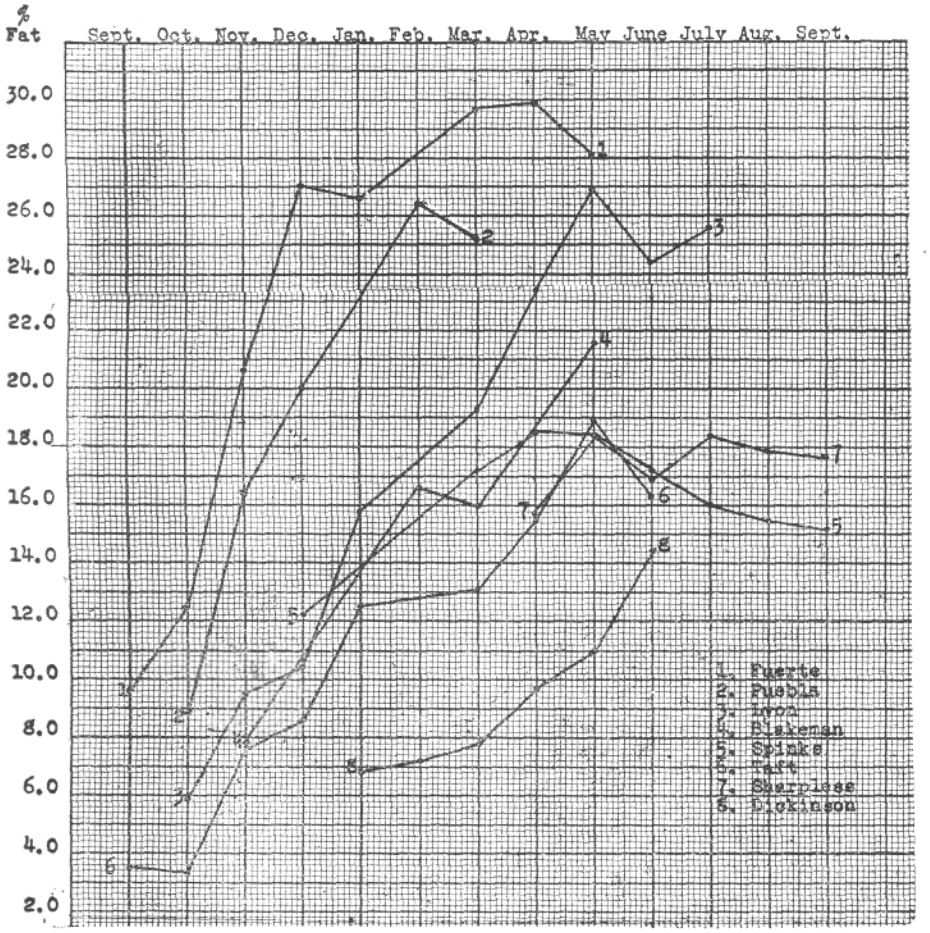

TABLE I. ANALYTICAL DATA ON BLAKEMAN AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
42.	Nov.	After storage	10.9	.9636	73.1	12.6	14.1	84.37	0.87	1.11	7.83	1.76	1.24	2.82
69.	Feb.	Immed.	14.3	.9915	76.8	12.9	9.9	75.67	1.38	1.01	13.93	1.69		
70.	Feb.	After storage	13.1	.9868	74.4	10.7	14.7	75.77	1.50	1.22	16.56	0.82	1.25	2.88
81.	March	After storage	16.5	1.0085	74.6	9.4	15.7	76.16	1.22	1.03	16.04	0.70	1.25	3.60
107.	May	After storage	18.2	1.0188	76.4	6.7	16.9	69.14	1.61	2.25	21.55	0.49	1.53	3.43

TABLE II. ANALYTICAL DATA ON DICKINSON AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
59.	Jan.	Immed.	11.6	1.0173	65.3	22.8	11.2	84.84	0.90	0.79	4.17	3.50		
60.	Jan.	After storage	10.6	.9428	68.4	21.9	9.5	86.47	1.20	1.01	6.84	0.37		
71.	Feb.	Immed.	11.2	1.0159	65.0	24.5	10.2	84.23	0.94	0.79	5.87	2.80		
72.	Feb.	After storage	9.7	.9753	67.6	19.7	13.0	86.10	1.02	0.94	7.20	0.55	1 34	2.85
83.	March	Immed.	11.4	1.0160	62.0	25.1	12.3	83.95	1.03	0.94	6.15	2.52		
84.	March	After storage	10.2	.9540	66.7	20.6	12.7	85.40	1.19	1.31	7.80	0.58	1.30	2.42
95.	April	Immed.	11.6	1.0063	62.0	23.3	14.3	84.56	1.23	1.37	7.63	0.67		
96.	April	After storage	10.5	.9650	65.8	20.8	13.1	84.71	1.12	1.31	9.68	0.36	1.19	1.63
110.	May	After storage	13.4	.9858	68.5	18.9	12.7	81.03	1.28	1.40	10.96	0.46	1.26	3.61
120.	June	Immed.	16.0	.9892	70.2	18.8	10.9	75.41	1.41	1.90	14.06	1.16		
121.	June	After storage	11.2	.9770	60.1	21.4	18.5	75.82	1.56	1.66	14.45	0.57	1.68	4.26

TABLE III. ANALYTICAL DATA ON FUERTE AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
23.	Sept.	Immed.	8.9	.9958	73.4	11.0	14.6	81.69	0.72	1.50	6.97	3.06	1.27	4.79
24.	Sept.	After storage	5.7	.9969	76.9	9.5	13.0	82.33	0.80	1.66	9.61	0.69	1.48	3.43
31.	Oct.	Immed.	11.5	.9921	77.6	8.3	13.5	78.35	0.76	1.44	11.32	2.12	1.35	4.66
32.	Oct.	After storage	10.1	1.0099	77.8	6.2	15.4	78.97	0.91	1.75	12.46	1.02	1.50	3.39
46.	Nov.	Immed.	11.2	.9864	78.0	7.7	13.8	72.72	1.02	1.55	17.61	1.08	1.32	4.70
47.	Nov.	After storage	10.2	1.0075	76.4	6.4	16.7	70.93	1.24	1.88	20.57	0.71	1.62	3.05
52.	Dec.	Immed.	12.2	.9764	77.1	8.3	14.1	67.42	1.17	1.71	23.99	0.58	1.47	3.66
53.	Dec.	After storage	10.0	.9810	80.5	6.8	12.5	64.18	1.69	1.99	26.99	0.57	1.64	2.94
62.	Jan.	Immed.	13.9	.9728	76.5	7.7	15.2	65.99	1.24	1.49	25.12	0.38	1.33	4.45
63.	Jan.	After storage	12.6	.9967	79.4	6.3	13.9	65.31	1.25	1.49	26.62	0.29	1.44	3.60
76.	March	Immed.	16.7	.9616	79.9	7.7	11.9	63.93	1.34	1.73	26.13	0.17	1.08	5.62
77.	March	After storage	14.7	.9861	81.6	5.6	12.7	62.08	1.43	1.68	29.74	0.39	1.36	3.32
88.	April	Immed.	13.9	.9596	79.2	9.1	11.2	63.46	1.40	1.88	28.19	0.11	1.25	3.71
89.	April	After storage	13.1	.9626	82.6	7.5	9.7	62.07	1.42	2.10	29.93	0.31	1.42	2.75
97.	May	Immed.	11.4	.9688	78.9	10.9	8.5	63.94	1.41	2.32	28.06	0.28	1.35	2.64
98.	May	After storage	11.4	.9616	85.0	6.0	9.7	61.08	1.33	2.32	30.15	0.13	1.24	3.75

TABLE IV. ANALYTICAL DATA ON LYON AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
27.	Oct.	Immed.	5.5	.9954	61.9	19.1	18.4	85.87	0.61	1.71	4.26	2.59		
28.	Oct.	After storage	4.8	.9790	65.5	15.6	18.6	85.45	0.87	2.10	5.90	1.56	1.15	2.97
38.	Nov.	Immed.	11.2	.9968	65.4	16.1	17.5	82.48	0.73	1.36	6.55	3.31		
39.	Nov.	After storage	9.1	.9144	66.7	13.8	19.4	83.13	0.81	1.71	9.52	1.81	1.20	1.82
54.	Dec.	Immed.	12.4	.9902	66.6	15.8	17.1	81.49	0.68	1.27	7.63	3.28		
55.	Dec.	After storage	9.8	.9292	69.0	12.9	18.0	80.59	0.93	1.49	10.42	2.24	1.16	3.17
65.	Jan.	Immed.	12.5	1.0052	68.0	18.2	13.5	73.20	0.96	1.93	14.01	2.92		
66.	Jan.	After storage	10.3	.9317	63.6	13.0	23.2	74.83	1.06	2.25	15.76	1.51	1.35	3.24
79.	March	Immed.	14.3	.9990	68.6	15.3	15.8	69.85	1.09	2.34	16.66	1.67		
80.	March	After storage	13.4	.9892	68.6	11.7	19.4	70.66	1.17	2.45	19.29	1.90	1.19	3.34
90.	April	Immed.	16.5	.9833	70.9	14.8	14.1	66.79	1.19	2.60	21.34	1.29		
91.	April	After storage	13.2	.9798	70.5	10.8	18.6	66.13	1.24	3.02	23.41	1.65	1.25	3.30
105.	May	Immed.	14.8	.9849	72.5	14.6	12.4	62.95	1.19	3.41	25.07	0.80		
106.	May	After storage	10.6	.9719	78.9	11.4	9.7	61.56	1.43	4.37	26.89	0.94	1.29	3.52
116.	June	Immed.	15.9	.9827	77.1	11.5	11.0	64.44	1.33	2.66	22.91	1.07		
117.	June	After storage	15.3	1.0051	76.9	9.5	13.0	64.58	1.29	3.28	24.43	0.37	1.22	4.83
122.	July	After storage	16.7	.9656	77.8	11.1	11.0	68.52	1.17	3.02	25.57	0.53	1.15	0.04

TABLE V. ANALYTICAL DATA ON PUEBLA AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
36.	Oct.	Immed.	6.9	1.0107	64.9	10.3	24.4	82.88	0.83	1.77	6.72	2.31		
37.	Oct.	After storage	5.7	1.0324	67.5	6.1	25.6	80.12	1.10	2.30	8.87	2.58	1.35	3.68
40.	Nov.	Immed.	7.2	1.0147	67.7	8.4	23.6	76.29	1.09	1.62	13.12	1.64		
41.	Nov.	After storage	6.9	1.0324	67.6	5.8	26.4	73.49	1.34	2.08	16.36	1.45	1.43	3.85
48.	Dec.	Immed.	7.6	1.0022	72.7	7.9	19.0	73.50	1.17	1.62	15.59	1.74		
49.	Dec.	After storage	6.6	1.0282	71.4	5.5	22.8	70.01	1.60	2.02	19.99	1.47	1.40	3.51
68.	Feb.	After storage	6.5	1.0225	68.1	8.1	23.3	63.59	1.72	2.19	26.45	0.88	1.42	3.75
82.	March	After storage	8.3	1.0232	74.0	6.2	19.4	64.89	1.77	2.27	25.33	0.75	1.12	3.87

TABLE VI. ANALYTICAL DATA ON SPINKS AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
56.	Dec.	Immed.	14.5	.9718	60.8	12.8	25.9	78.55	1.13	1.40	11.03	2.16		
57.	Dec.	After storage	13.0	.9460	64.8	11.8	23.3	77.62	1.52	1.77	12.22	1.06	1.27	4.54
74.	March	Immed.	15.8	.9853	64.1	12.2	23.3	76.15	1.19	1.53	14.36	1.52		
75.	March	After storage	12.6	.9950	69.8	10.6	19.1	73.04	1.42	1.84	17.23	0.93	1.28	4.26
85.	April	Immed.	17.5	.9527	65.2	13.5	20.7	72.56	1.43	2.36	18.13	0.58		
86.	April	After storage	18.8	1.0001	69.5	8.5	21.8	72.66	1.44	2.32	18.53	0.59	1.09	3.37
108.	May	Immed.	21.0	.9450	68.5	9.4	21.7	73.74	1.40	2.40	16.96	0.17		
109.	May	After storage	19.3	.9977	73.0	7.0	19.2	72.85	1.54	2.36	18.37	0.53	1.11	3.24
118.	June	Immed.	16.9	.9403	69.1	11.2	19.3	74.15	1.24	1.79	17.03	0.42		
119.	June	After storage	13.1	1.0038	71.0	11.2	17.7	73.47	1.42	1.92	17.21	0.62	1.37	3.99
125.	July	After storage	17.5	1.0147	64.0	7.0	29.0	75.66	1.42	1.66	16.04	0.40		
126.	Aug.	After storage	15.3	1.0152	69.5	8.9	21.4	75.27	1.53	2.70	15.54	0.62	1.20	3.14
129.	Sept.	After storage	18.8	.9830	71.8	8.1	20.2	75.66	1.60	2.62	15.14	0.40	1.09	3.49

TABLE VII. ANALYTICAL DATA ON SHARPLESS AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
92.	April	Immed.	18.5	.9906	75.2	13.7	10.4	77.11	1.13	1.07	14.73	1.54		
93.	April	After storage	18.2	.9312	77.9	10.6	11.7	77.34	1.23	1.37	15.68	0.58	1.13	2.67
101.	May	Immed.	16.4	.9884	72.1	15.1	12.5	76.11	1.17	1.13	16.05	0.88		
102.	May	After storage	11.7	.9501	75.1	12.8	12.0	74.57	1.38	1.27	18.41	0.60	1.14	2.63
112.	June	Immed.	18.8	.9811	75.3	13.2	11.2	76.99	1.29	1.33	15.79	0.41		
113.	June	After storage	23.0	.9255	81.9	7.9	10.2	75.83	1.46	1.31	16.91	0.40	1.12	2.97
124.	July	After storage	22.4	.9781	80.0	9.2	10.6	74.65	1.50	1.44	18.39	0.27	1.09	2.66
127.	Aug.	Immed.	26.6	.9812	78.2	11.7	10.0	73.33	1.42	1.78	18.47	0.34		
128.	Aug.	After storage	23.4	.9908	84.0	7.5	8.6	73.97	1.58	1.92	17.88	0.25	1.12	3.28
130.	Sept.	After storage	22.9	.9762	82.8	7.6	9.2	74.94	1.51	1.36	17.71	0.36	1.20	2.92

TABLE VIII. ANALYTICAL DATA ON TAFT AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
25.	Sept.	Immed.	4.8	.9870	64.7	10.7	23.9	87.97	0.58	1.23	2.20	3.60		
26.	Sept.	After storage	3.8	.9869	71.5	8.6	19.8	88.67	0.79	1.36	3.51	1.58	1.00	3.09
34.	Oct.	Immed.	7.4	1.0044	71.3	16.5	11.4	87.57	0.59	0.96	2.39	3.50		
35.	Oct.	After storage	4.9	.9460	71.8	16.4	11.8	88.67	0.67	1.16	3.34	2.04	0.73	3.39
44.	Nov.	Immed.	9.8	1.0001	70.6	17.0	11.6	84.34	0.72	0.66	6.45	2.93		
45	Nov.	After storage	8.5	.9443	67.3	16.7	15.8	84.46	0.85	0.83	7.56	1.71	0.99	3.60
50.	Dec.	Immed.	7.9	1.0020	68.9	17.0	13.3	83.58	0.78	0.52	6.88	2.51		
51.	Dec.	After storage	8.3	.9749	70.8	13.8	15.3	83.86	1.13	0.79	8.60	1.28	0.93	3.41
61.	Jan.	After storage	8.2	.9324	70.1	16.2	13.7	80.04	1.24	1.03	12.46	0.71	0.97	3.55
78.	March	After storage	14.4	.9927	72.0	11.7	16.3	78.87	1.11	0.79	13.12	0.68	0.91	4.52
87.	April	After storage	14.2	.9836	70.1	12.2	17.2	76.52	1.35	1.40	15.51	0.71	0.95	3.56
103.	May	Immed.	15.8	.9811	69.8	15.1	14.6	72.01	1.60	1.53	19.48	0.71		
104.	May	After storage	15.3	1.0025	71.6	10.8	17.4	73.75	1.45	1.31	18.89	0.58	1.03	2.99
114.	June	Immed.	16.4	.9981	66.4	14.5	18.9	71.56	1.47	1.22	20.27	0.44		
115.	June	After storage	10.8	1.0141	70.4	11.1	18.7	76.19	1.51	1.31	16.34	0.68	0.97	3.00

TABLE IX. ANALYTICAL DATA ON MISCELLANEOUS AVOCADOS

No.	Month picked	Analyzed	Av. Wt. oz.	Sp. Gr.	Pulp %	Skin %	Seed %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %	Undetermined %
Oakley No. 1—														
131.	Sept.	Immed.	19.6	.9743	73.0	9.2	17.5	70.78	1.21	3.01	16.92	0.40		
Oakley No. 1—														
132.	Sept.	After storage	17.2	1.0157	76.6	6.1	17.2	69.45	1.30	3.81	19.44	0.78	1.57	3.65
Oakley No. 2—														
133.	Sept.	Immed.	16.8	.9523	72.3	8.1	19.2	78.24	0.83	1.94	12.07	2.04		
Oakley No. 2—														
134.	Sept.	After storage	16.3	.9607	79.2	5.8	14.9	78.01	0.96	2.67	13.63	0.80	1.11	2.82
Oakley No. 3—														
135.	Sept.	After storage	15.9	.9865	83.6	6.2	10.1	71.13	1.41	3.54	18.23	0.59		
Oakley No. 4—														
136.	Sept.	After storage	10.4	1.0083	77.2	6.9	15.8	65.76	1.58	3.67	22.64	0.50	1.54	4.31
Hoff Seedling—														
142.	Nov.	After storage	13.6	1.0013	76.2	6.3	17.5	71.13	1.51	2.23	18.47	....	1.34	5.32
Kanola—														
144.	March	After storage	7.1	.9941	63.4	21.5	15.1	71.50	....	0.97	20.91	0.62	1.25	....

TABLE X. ANALYSES OF AVOCADOS AT TIME OF MAXIMUM FAT CONTENT

Month picked	Variety	Sp. Gr.	Pulp %	Skin %	Seeds %	Moisture %	Ash %	Protein %	Fat %	Total Sugars %	Crude Fiber %
May	Blakeman	1.019	76.38	6.7	16.9	69.14	1.61	2.25	21.55	0.49	1.53
June	Dickinson	.977	60.13	21.4	18.5	75.82	1.56	1.66	14.45	0.57	1.68
April	Fuerte	.963	82.58	7.5	9.7	62.07	1.42	2.10	29.93	0.31	1.42
May	Lyon	.972	78.94	11.4	9.7	61.56	1.43	4.37	26.89	0.94	1.29
Feb.	Puebla	1.022	68.12	8.1	23.3	63.59	1.72	2.19	26.45	0.88	1.42
May	Sharpless	.950	75.14	12.8	12.0	74.57	1.38	1.27	18.41	0.60	1.14
April	Spinks	1.000	69.48	8.5	21.8	72.66	1.44	2.32	18.53	0.59	1.09
May	Taft	1.002	71.57	10.8	17.4	73.75	1.45	1.31	18.89	0.58	1.03