A similar result is obtained when the hydrogen ion concentration is held constant (pH 4) and the acetate ion concentration is varied. In Figure 4 a plot of the rate constant vs. the acetate ion concentration shows a half-order dependence on acetate ion. Furthermore, a plot of the undissociated acetic acid concentration in both sets of experiments vs. the rate constant shows approximately one-half-order dependence on acetic acid. In all experiments the results were the same whether the rate was measured by the optical rotation of the total solution or by gas–liquid chromatographic analysis of the formation of PCA.

CONCLUSION

The data presented here indicate that the cyclization of glutamine to PCA at 100° is first order in glutamine and catalyzed by acid. However, the role of acetic acid in this reaction is complicated by its half-order kinetics. Therefore, any mechanism proposed for this reaction must consider the unusual kinetics observed for acetic acid catalysis. The rate can be expressed either in terms of the hydrogen ion or acetate ion concentrations as: rate = $k[H^+]^{1/2} \cdot [Ac^-]^{1/2}$[glutamine].

Although this work was done with a well-defined model system it does imply some facts about the role of glutamine in the formation of PCA during the thermal processing and storage of foods. For example, when a standard thermal process does not result in complete conversion of free glutamine to PCA, the final level of PCA will be affected by the concentration of any catalyst which may be present. This study indicates that the greater the acidity of a food the greater the rate of PCA formation from glutamine.

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Correction

SEASONAL VARIATION IN THE COMPOSITION OF CALIFORNIA AVOCADOS

In this article by Grant G. Slater, Solomon Shankman, John S. Shepherd, and Roslyn B. Alfin-Slater [*J. Agric. Food Chem.* **23**(3), 468 (1975)] some of the data in Table II, p 469, were not accurate. The correct information appears in the following table.

Table II. Fatty Acids of California Avocados[a]

	Fuerte					Hass		
Component	10/22/68[b]	2/13/69	12/7/68	4/5/68	Av	4/5/68	6/4/68	Av
			As Percent of Total Fatty Acids					
Saturated[c]								
Palmitic	16.5	12.1	10.0	10.6	12.3	16.1	4.1	10.1
Stearic	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
Subtotal	16.5	12.1	10.0	10.6	12.3	16.2	4.1	10.2
Unsaturated[c]								
Palmitoleic	5.9	1.9	1.3	4.8	3.5	7.4	0.5	4.0
Oleic	71.8	73.9	82.2	72.5	75.1	63.5	93.3	78.4
Linoleic	6.0	10.5	6.6	11.2	8.6	12.2	2.2	7.2
Linolenic[d]	0.0	0.7	0.1	0.8	0.4	0.8	0.0	0.4
Arachidonic	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0
Subtotal	83.7	87.1	90.2	89.3	87.7	83.9	96.0	90.0
Total	100.2	99.2	100.2	99.9	100.0	100.1	100.1	100.2
Ratio unsat./sat.[e]	5.1	7.2	9.0	8.4	7.4	5.2	23.4	14.3
Ratio P/S[f]	0.36	0.93	0.67	1.13	0.73	0.80	0.53	0.75
			As Percent of Pulp[g]					
Saturated								
Palmitic	1.2	1.3	1.5	2.2	1.7	2.6	0.8	1.8
Stearic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unsaturated								
Palmitoleic	0.4	0.2	0.2	1.0	0.5	1.2	0.1	0.7
Oleic	5.4	8.1	12.7	14.9	10.2	10.1	18.3	13.8
Linoleic	0.4	1.1	1.0	2.3	1.2	1.9	0.4	1.3
Linolenic	0.0	0.1	0.0	0.2	0.1	0.1	0.0	0.1
Arachidonic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[a] Average of two determinations on the ripe fruit from a composite sample of 15 avocados. [b] Date fruit arrived at Shankman Laboratories. [c] The range of error estimated by Dr. Shankman as ±0.7%. [d] Plus related acids. [e] Unsaturated fatty acids/saturated fatty acids. [f] Polyunsaturated fatty acids/saturated fatty acids. [g] Assumptions used were: unsaponifiable fraction 2%, glycerol 7.6%, phospholipid residues, etc, 0.4%, for a total of 10% non-fatty acids.