

part of the determinable carbonyls in rancid fat do not originally exist in the oxidized fat as free carbonyls. They are apparently produced through breakdown of precursors by reaction conditions used in isolation. This seems to be also characteristic of autoxidized dehydrated potatoes. Samples stored in open air do not show appreciable compounds in their headspace vapors on enclosing in a flask, but show large concentration of carbonyls on steam distillation or hot reconstitution. Such conditions are brought about in normal food preparation and, therefore, these "bound" compounds are important in considering flavor.

### Acknowledgment

The author is indebted to representatives of member firms of the Instant Potato Granule Manufacturers Association for continued interest and helpful suggestions, in particular to R. M. Stephenson, American Potato Co., J. M. Fogelberg, R. T. French Co.; and R. W. Kueneman, J. R. Simplot Co. The author also thanks R. Teranishi and C. E. Hendel, Western Utilization Research and Development Division, for helpful discussion and suggestions and Delpha Venstrom for technical assistance with the organoleptic appraisal.

### Literature Cited

- (1) Bergström, S., Blomstrand, R., Laurell, S., *Acta Chem. Scand.* **4**, 245 (1950).
- (2) Boggs, M. M., unpublished work, Western Regional Laboratory, Albany 10, Calif.
- (3) Bolland, J. L., *Trans. Faraday Soc.* **44**, 669 (1948).
- (4) Burton, W. G., *J. Soc. Chem. Ind. (London)* **64**, 215 (1945); **68**, 149 (1949).
- (5) Craig, B. M., Murty, N. L., *Can. J. Chem.* **36**, 1297 (1958).
- (6) Duncan, D. B., *Biometrics* **11**, 1 (1955).
- (7) Ellis, R., Gaddis, A. M., Currie, G. T., Abstract No. 86, 20th Meeting, IFT, May 15, 1960.
- (8) Gaddis, A. M., Ellis, R., Currie, G. T., *Food Research* **24**, 283 (1959).
- (9) *Ibid.*, **25**, 495 (1960).
- (10) Hendel, C. E., Burr, H. K., Boggs, M. M., U. S. Dept. Agr., Bur. Agr. and Ind. Chem., Circ. **AIC-303**.
- (11) Herb, S. F., Magidman, P., Riemenschneider, R. W., *J. Am. Oil Chemists' Soc.* **37**, 127 (1960).
- (12) Highlands, M. E., Licciardello, J. J., Herb, S. F., *Am. Potato J.* **31**, 353 (1954).
- (13) Holman, R. T., Elmer, O. C., *J. Am. Oil Chemists' Soc.* **24**, 127 (1947).
- (14) James, A. T., *Biochem. J.* **52**, 242 (1952).
- (15) Johnson, O. C., Chang, S. S., Kummerow, F. A., *J. Am. Oil Chemists' Soc.* **30**, 317 (1953).

- (16) Kawahara, F. K., Dutton, H. J., Cowan, J. C., *Ibid.*, **29**, 633 (1952).
- (17) Kerr, J. A., Trotman-Dickenson, A. F., *J. Chem. Soc.* **1960**, 1602.
- (18) Kröner, W., Volksen, W., "Die Kartoffel," 2nd ed., Johann Ambrosius Barth, Leipzig, 1950.
- (19) Lovelock, J. E., *Nature* **182**, 1663 (1958).
- (20) Mattick, L. R., Lee, F. A., Abstract No. 85, 20th Meeting, IFT, May 15, 1960, San Francisco, Calif.; also in *Food Technol.*, April 1960.
- (21) McWilliam, I. G., Dewar, R. A., "Gas Chromatography," ed. D. A. Desty, p. 142, Butterworth, London, 1958.
- (22) Nonaka, M., Phippen, E. L., Bailey, G. F., *Anal. Chem.* **31**, 875 (1959).
- (23) Orr, C. H., Callen, J. E., *J. Am. Chem. Soc.* **80**, 249 (1958).
- (24) Ralls, J. W., *Anal. Chem.* **32**, 332 (1960).
- (25) Teranishi, R., unpublished work, Western Regional Laboratory, Albany 10, Calif.
- (26) Thompson, A. E., *J. Chromatog.* **2**, 148 (1959).

Received for review September 16, 1960. Accepted March 30, 1961. Work carried out in cooperation with the Instant Potato Granule Manufacturers Assoc., who supplied potato granules and other materials used. Mention of suppliers of chemicals or equipment does not imply recommendations over comparable products of other manufacturers. Work done at a laboratory of the Western Utilization Research and Development Division, Agricultural Research Service, U. S. Department of Agriculture.

## LITERATURE AVAILABLE

**Soil Insect Control.** New educational film shows common soil pests of corn, plus latest insect control methods. Film is in color and sound, runs about 17 minutes. Corn rootworms, wireworms, white grubs, seed corn beetles and maggots, cornfield ants, corn root aphids, billbugs, grape colaspis larvae, and sod webworms are among insects shown destroying corn. Scenes showing application of insecticides under actual farm conditions will aid in choice of control method. Prints of the film may be obtained on a free loan basis for specific showing dates by writing to Dept. A&F, VELSICOL CHEMICAL CORP., 330 East Grand Ave., Chicago 11, Ill.

**Insecticide Compounds.** Manufacturer of agricultural chemicals offers series of pamphlets describing formulations and uses for insecticide compounds. Booklets available are: GAC 131-C, Diazinon Insecticides Handbook; GAC 160, Diazinon for Control of Pests on Fruit; GAC 161, Diazinon for Control of Pests on Vegetables; GAC 357-A, Sequestrene for Iron Chlorosis in Ornamentals; GAC 416, Methoxychlor, Multi-pur-

pose Insecticide; GAC 642, Simazine, Grass and Weed Control in Corn; GAC 643, Simazine, Industrial Weed Control; GAC 728, Applying Atrazine or Simazine Herbicides; GAC 730, Atrazine, Simazine, Weed Control in Corn; GAC 731, Atrazine, Weed Identification and Control; and GAC 732, Atrazine, Weed Control in Corn. Single copies are available from Dept. A&F, GEIGY AGRICULTURAL CHEMICALS, Saw Mill River Rd., Ardsley, N. Y.

**Cover-Odors.** New perfume catalog is devoted to a wide variety of perfume oils and perfumers' materials. Section of special interest to manufacturers of industrial products contains a large list of Cover-Odors, used to mask unpleasant scents in such materials as insecticides, fertilizers, waxes, and solvents. Copies of the Florasynth Perfume Catalog may be obtained from Dept. A&F, FLORASYNTH LABORATORIES, INC., 900 Van Nest Ave., New York 62, N. Y.

**Aquatic Weed Killer.** Aquathol, said to control horned pondweed,

water stargrass, milfoil, bassweed, floating-leaf pondweed, burr weed, and duckweed, destroys by fast contact rather than slow hormonal action. The new product has the advantage of ease of application, quick action, safety, economy, and short residual life. Aquathol is available in liquid granular form. For further information, address request to Dept. A&F, Agricultural Chemicals Div., PENNSALT CHEMICALS CORP., 2901 Taylor way, Tacoma, Wash.

**Insecticide Handbook.** "Insecticide Recommendations of Entomology Research Division for Control of Insects Attacking Crops & Livestock for 1961," Agriculture Handbook 120, details recommended safe uses for chemicals that protect crops and livestock. Recommendations are intended as guide for entomologists, other research and extension workers, and various agricultural associations and agencies, rather than for individual farmers. Single copies may be obtained for 65¢ from Dept. A&F, Superintendent of Documents, U. S. GOVERNMENT PRINTING OFFICE, Washington 25, D. C.