A Simplified Method for the Evaluation of Antioxidants

ABSTRACT

A procedure is described for rapid evaluation of antioxidants. Dilute aqueous emulsions of an antioxidant, carotene and lipid were prepared in spectrometer tubes. The oxidative destruction of carotene in the emulsion was observed directly with a colorimeter. The antioxidants were then evaluated according to their effect on the rate of carotene decolorization.

Numerous techniques have been developed for the evaluation of antioxidants, some of which have been reviewed recently by Marco (1). The method developed by Marco provides a rapid, reliable system for analyses that alleviates many of the shortcomings encountered with other techniques. A simplification of Marco's method is described in this paper.

A dilute, oxygenated emulsion was prepared in a similar manner to that described by Marco. A 2.0 gm sample of crystalline β-carotene was dissolved in 10 ml of chloroform. One milliliter of this solution was then pipetted into a round-bottomed flask which contained 20 mg of purified linoleic acid and 200 mg of Tween 40 emulsifier. After removal of chloroform on a rotary evaporator, 50 ml of oxygenated, distilled water was added to the flask with vigorous stirring. A 5 ml aliquot of the aqueous emulsion which formed was then pipetted into each of a series of spectrometer tubes which contained 0.2 ml portions of ethanolic antioxidant solution. A zero reading was taken at 470 nm on the reaction mixture in each tube immediately after addition of the emulsion to the antioxidant solution. (A Bausch and Lomb Spectronic 20 colorimeter and Bausch and Lomb spectrometer tubes were used.) The tubes were then stoppered and placed in a water bath at 50 C. Subsequent readings were taken at regular intervals until the carotene had been decolorized (about 1-3 hr). About 5 sec were required to take a spectrometer reading. This is not enough time for a temperature change to occur in the reaction media which would cause a significant change in the reaction rate. The results of a typical experiment are shown in Figure 1. This procedure is simple and gives quick results. The experimental setup is uncomplicated, and 10 or more samples can be evaluated simultaneously without difficulty.

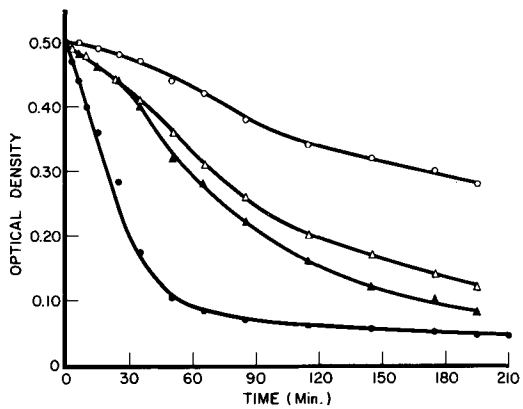

FIG. 1. Carotene destruction in the presence of BHT and cocoa hull extractives. The control sample with no antioxidant added is represented by •; BHT (8 mg/liter) by ○; cocoa hull extract A (30 mg/liter) by △; and cocoa hull extract B (80 mg/liter) by ▲.

H.E. MILLER
General Mills, Inc.
James Ford Bell Technical Center
9000 Plymouth Avenue
Minneapolis, Minnesota 55427

REFERENCE

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High Levels of Acetone Found in Male Turkey Skin[1]

ABSTRACT

Investigation of the carbonyl compounds in the hexane extractable lipid of raw poultry skin revealed that the only monocarbonyl present was acetone. Furthermore, in male turkeys the level of acetone was significantly greater than the level observed in either chickens or female turkeys. During maturation, increased acetone concentrations were accompanied by low lipid deposition in the tissue.

Investigations in our laboratory on poultry flavor have involved the characterization and quantification of carbonyl compounds associated with the lipids isolated from the skin of chickens and turkeys (1,2). This report illustrates the unique variation in the concentration of acetone in the raw skin of both groups of birds due to sex and age.

Ten chickens and five turkeys of each sex were raised on standard commercial rations and slaughtered at each of three ages. The main body skin was removed immediately after slaughter and the hexane extractable lipids were isolated from homogenized samples with carbonyl-free hexane. The carbonyl analyses were conducted in triplicate on the hexane extracts passed through Celite impregnated

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