

conjugated dienoic acid reported here would travel droxylated conjugated diene. Chromatography showed no unusual components in *Centaurea cyanus*, *Cosmos bipinnatus*, *Liatrus spicata*, or *Vernonia missurica*.

### Summary

Screening analyses of oils from seeds of 16 species of the *Compositae* family reveal numerous indications of unusual component fatty acids or interferences with the application of standard methods. Epoxyoleic acid is indicated in amounts from 1% to 67%. Conjugated dienes equivalent to 5% to 48% of  $C_{18}$  acid appear in four oils. Hydroxyl groups are found in two oils in amounts corresponding to 20% and 70% of a  $C_{18}$  acid.

Of special interest is the oil from *Dimorphotheca aurantiaca*, which appears to contain some 50% of an acid with both an hydroxyl group and conjugated diene.<sup>3</sup>

Oil from *Rudbeckia bicolor* var. *superba* contains 76% of apparent linoleic acid and may rank among the richest sources of this acid.

### • Letter to the Editor

## A Low-Cost Bench-Top Shortening Blender

A CONVENIENT APPARATUS which would allow the preparation of small batches (300–500 g.) of blended shortening containing oil, emulsifier, antioxidant, water, etc., for evaluation and which could be constructed from equipment commonly available in the laboratory is desirable both from the standpoint of ease of use and for the lower cost involved in preparing pilot-batches.

We wish to report an apparatus which we have found useful for screening fats, oils, and additives on a small scale. The apparatus consists of a stand having a rod supported parallel to the rod of the stand by means of clamp holders and two 5½-in. sections of rod<sup>1</sup> at right angles to the two main rods.

To the supported rod, the mixer section of a commercial household mixer with an attachment rod at a right angle to the mixer blade is attached.

A scraper with an adjustable radius to accommodate beaker sizes from 600 to 3,000 ml. (this allows for the preparation of larger samples) is constructed by attaching two rubber bowl scrapers through the holes of two flexaframe connectors attached to a 4½-in. rod and separated from each other by a third flexaframe connector. This scraper unit is connected to the mixer motor by means of a 5½-in. piece of flat metal having a hook on the end<sup>2</sup>, which is inserted through the other opening in the center flexaframe connector.

This metal piece is, in turn, attached by means of a straight tubular chuck, having two set screws, to a shaft made by removing the blades from one of the mixer beaters, and the shaft is connected to the mixer in the usual way. The rate of stirring may be regulated either by means of the mixer control or by use of a powerstat.

The shortening blend is prepared by melting the vegetable oil or animal fat in a beaker of suitable size and adding the other components. The beaker is then transferred to a suitable container having a cooling medium (water, ice, etc.) and is supported by a standard laboratory support ring attached to the support stand. The beaker may be secured in this ring by means of a cork of suitable size cut lengthwise and placed between the beaker and ring. The rate of

<sup>1</sup> These shorter sections may be conveniently prepared by sawing the clamp portion off extension clamps which, due to corrosion of the adjustment screws or other causes, are no longer functional.

<sup>2</sup> The handle of a laboratory brush may be used here.

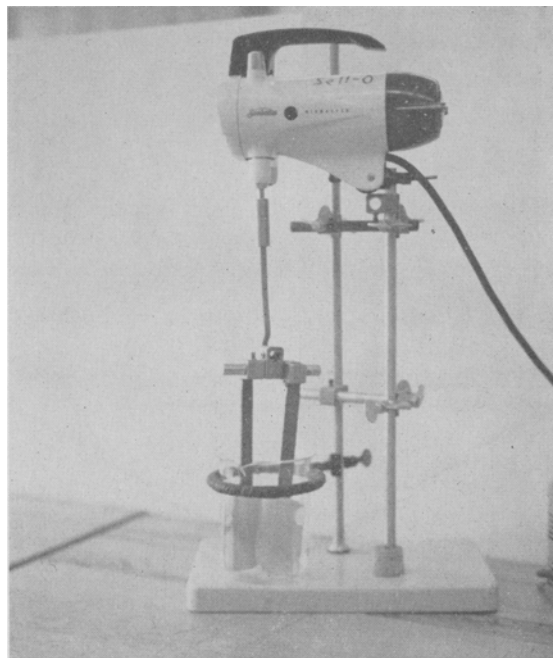
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solidification of the blend is governed by the medium in which the beaker is placed. Rapid stirring is continued until an extremely viscous product is obtained.

This procedure does not allow for a controlled incorporation of air. However it does provide an economical method for primary evaluation of shortening systems. It is felt that this method may also find application in fields other than that involving shortenings, such as slush freezing of fruit juices (using dry ice as a coolant) and blending of solid propellant compositions.

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