Examination of the non-dialysable fractions (which include all the galactolipids present) showed that whereas in the leaves the values for galactose and glycerol indicated that the fraction consisted mainly of galactolipids, as previously found for other leaves, in the pods and seeds the galactose contents were considerably lower.

The relative contents of chlorophyll-like pigments, as measured by the blue colour of the acetone extracts using a Lovibond tintometer, indicated that the leaves contained much more of these pigments than did the seeds, and in general the amounts of galactolipids calculated from galactose contents followed approximately those of the chlorophyll-like pigments.

In agreement with Wagenknecht[6] we have been able to demonstrate that the acetone-soluble lipids of pea seeds are comprised largely of triglycerides. Whereas, however, Wagenknecht[6] considered that the sugars associated with this fraction are solely contaminants, our present work as well as earlier work[2–4] support the view that the sugars are combined in the lipid molecule.

The present results confirm that galactolipids are the main acetone-soluble lipids in leaves, but in addition indicate the presence of trace amounts of triglycerides in these tissues. Moreover, while triglycerides are the main component of seed lipids it is now shown that in some seeds, at least, traces of galactolipids may also be present. The work in this field is being continued.

S. Adhikari
F. B. Shorland
R. O. Weenink

Department of Scientific and Industrial Research
Fats Research Laboratory,
Wellington,
New Zealand.

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Isolation of a New Antioxidant from Oats

The antioxidant properties of oatmeal are well known[1] and have been ascribed to phospholipids[2]. Oats are also rich in tocopherols[3] which function as antioxidants. We now report the isolation of an active antioxidant from oats which belongs to neither of these classes.

Whole oat kernels were freed from most of their oil by soaking in light petroleum (boiling point below 40° C.) for several days. A crude preparation of the antioxidant was obtained by extracting the defatted kernels with diethyl ether. This was purified by precipitation from solution in diethyl ether by the addition of light petroleum followed by chromatography on columns of silicic acid.

The purified antioxidant is almost colourless, melting point 85° C., soluble in most organic solvents, but insoluble in light petroleum and water. It has the properties of a phenol, dissolves in aqueous alkali to give a bright yellow solution and gives a green colour with ferric chloride, which suggest the presence of a free catechol nucleus. It has a characteristic ultraviolet absorption spectrum with a principal maximum at 331 mμ (in ethanol), E(1 cm., 1 per cent), 440. Analysis of two specimens gave: C, 69·9, 69·7; H, 8·4, 8·9; OCH_3, 3·8, 4·1 per cent molecular weight by Barger's method, 700; no nitrogen or phosphorus was found. On alkaline hydrolysis caffeic acid, ferulic acid and a neutral substance were obtained apparently in equimolecular proportions.

The neutral component was crystallized from ethyl acetate giving colourless needles, melting point 105° (found: C, 76·9; H, 13·1; M, 290). It formed an acetate, melting point 70°, and on oxidation with chromium trioxide in acetic acid gave an acid melting point 114°. The infra-red absorption spectrum with bands at 1,716 cm.$^{-1}$ (C=O stretching) and at 3,300 and 1,055 cm.$^{-1}$ (OH stretching and bending respectively), for which we are indebted to Dr. M. J. Fishwick, of the Low Temperature Research Station, Cambridge, suggests that it may be a keto-alcohol.

Table 1. Antioxidant Activities measured in Arbitrary Units/mgm.*

Substance	Antioxidant activity (units/mgm.)
Purified oat antioxidant	30
Caffeic acid	90
Ferulic acid	14
Neutral component	0
Propyl gallate	30
Butylated hydroxytoluene	30

* The increase in induction period (hr.) when 100 mgm. of an oat oil (petroleum-soluble) was oxidized in oxygen in the presence of 1 mgm. of a test sample, was a measure in arbitrary units of the activity of the latter.

The results in Table 1 show the antioxidant activity of the new substance and its constituent parts as measured by a recording oxygen apparatus[4]. For comparison, the corresponding figures for the two synthetic antioxidants, n-propyl gallate and butylated hydroxytoluene, are also included. The results suggest that the activity of the antioxidant is largely related to its caffeic acid content.

Work is in progress to elucidate precisely the structure of this natural antioxidant and to determine the extent to which it is present in wheat and other cereals.

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D. G. H. Daniels
H. F. Martin

Research Association of British Flour Millers,
Cereals Research Station,
Old London Road,
St. Albans, Herts.

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Effect of Adrenalectomy on the Activity of Enyzmes of the Urea Cycle in Rat Liver

The procedures for the estimation of enzymes of the urea cycle reported by Brown and Cohen[1] have made it possible to study quantitatively the effect of hormones on the individual reactions of the urea cycle. These authors have recently shown that, in rat liver, the condensing enzyme of the arginine synthetase system is rate-limiting and will thus be a pacemaker for the whole system[2]. It is at such rate-