lack of inhibition by quinacrine is not unequivocal evidence for the absence of a functional flavoenzyme.

DPNH–NT reductase does not appear to utilize the amytal-sensitive route connecting oxidation of reduced diphosphopyridine nucleotide with the cytochrome chain[6]. However, it would seem that DPNH–NT reductase involves a quinone structure similar in properties to vitamin K_1 and which can be inhibited by both vitamin K_3 and dicoumerol. The effects of vitamins K_1 and K_3 on DPNH–NT reductase are the reverse of those found for succinate–neotetrazolium chloride reductase[4] but are analogous to the effects of vitamins K_1 and K_3 on oxidative phosphorylation[7]. The effects of such quinones as 1.4-naphthaquinone and vitamin K_3 on DPNH–NT reductase are being investigated further to ascertain if their inhibitory power is an unspecific redox property or is the result of competitive inhibition with another quinone structure.

Using sucrose homogenates the distribution of DPNH–NT reductase in intracellular fractions was investigated. The following centrifugal accelerations for the times indicated were used to separate each fraction: (*a*) nuclear fraction, $600g \times 10$ min.; (*b*) mitochondrial fraction, $10{,}000g \times 15$ min.; (*c*) microsomal fraction, $105{,}000g \times 30$ min. The reductase appears to be largely associated with the mitochondrial and microsomal fractions. In a typical experiment the percentage of the total activity associated with each fraction was: nuclear, 8; mitochondrial, 60; microsomal, 28; and soluble fraction, 3.

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Carotene Content of *Ulex europaeus* (Common Furze)

A general investigation has been in progress for some time in this Department into certain aspects of the chemistry of *Ulex europaeus*. This common furze has a local reputation as a supplementary animal foodstuff, while it has also been reported from France as a suitable fodder for sheep[1].

The analytical results (mean percentages) from air-dried samples of furze growing on waste land in County Cork during the past year are as follows: moisture, 18·4; crude protein, 10·2; fibre, 26·6; fat, 1·2; nitrogen-free extract, 41; inorganic matter, 2·6.

No previous results are available on the carotene content of the green matter (spines) of furze and its seasonal variation, which are now reported. The following procedure has been followed in making the determinations on fresh plant material.

The furze bushes were collected in the mornings; the green, prickly spines were taken for analysis and the main woody portion of the plant discarded. The spines were chopped as soon as possible after picking. Representative samples were blanched for 1 min. in boiling water[2] and stored in a frozen condition when analysis was not immediately undertaken. Losses of carotene of up to 15 per cent were recorded when unblanched samples were analysed after 1 hr. storage. The procedure also facilitated extraction of the pigments.

The furze samples were treated with a 3 : 2 mixture of acetone–petroleum ether (boiling point, 40–60° C.) for 2 min. in a high-speed 'blendor' fitted with a small baffle-plate[3]. Calcium carbonate, just sufficient to neutralize plant acids, was added[4]. The extract was filtered, the entire process repeated twice more and acetone washed from the bulked solvent solution with water. Three processings were found to be sufficient as analysis of residues yielded no pigments.

The petroleum ether solutions were chromatographed on 10 cm. × 1·5 cm. columns of either, (1) a mixture of equal parts of magnesium oxide ('Sea Sorb 43' Fischer) and 'Hyflo-Super Cel' Johns-Manville[5], or (ii) alumina[6]. In both cases the columns were topped by a 2-cm. layer of anhydrous sodium sulphate. Carotene was eluted with 4 per cent ether in petroleum ether. Elution could be followed visually and its completion readily gauged. The eluate was made up to volume and its absorption measured on a Beckman spectrophotometer (model *D.U.*). Control analyses showed quantitative recovery of carotene added to furze samples.

The variation in carotene content of furze over a year's survey is shown in Table 1.

Table 1

Month	Carotene (mgm./kgm. dry weight)	Month	Carotene (mgm./kgm. dry weight)
January	124	July	253
February	125	August	230
March	134	September	138
April	159	October	147
May	171	November	120
June	235	December	101

Separation of the carotene mixture showed that β-carotene was the main constituent, up to 95 per cent of the total.

From October to February or March—when furze is fed to stock—the average carotene content is 126 mgm./kgm., indicating that it is a very good, and freely available, source of carotene. The relatively high values during the summer months point to the possibility of using dried furze meal as a supplementary source of carotene in animal feeding.

The problem of retention of carotene in dried furze is being investigated concurrently with that of the amino-acids in the furze protein, and a detailed report will be published later.

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