active derivative is the major methylating agent for glycine.

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Ubiquinone and Tocopherol in Birds

Unlike the rat and the rabbit, it seems from nutritional studies made by several groups of workers that the chicken needs little vitamin E, providing its diet contains an adequate supply of selenium and only limited amounts of unsaturated fat[1–3]. Since tissue-levels of ubiquinone in the rat[4] and rabbit[5] are high compared with those given for some other animal species[6] and since these levels have been found to be dependent on vitamin E [4,5], it was of some interest to investigate tocopherol- and ubiquinone-levels in the chicken and some other avian species, with particular reference to those which show considerable differences in their basal metabolic rates. Chickens were reared to 7 weeks on an ordinary commercial ration, and a group of 4 pigeons and 12 canaries were purchased as adult birds from a commercial supplier. Selected tissues from each species were examined for ubiquinone, ubichromenol and α-tocopherol by analytical methods described previously[7].

As shown in Table 1, extremely low levels of tocopherol were confirmed in the young chicken, and the ubiquinone-levels in this species were among the lowest yet observed by us in animal tissues. The tissues of the pigeon and canary contained considerably higher concentrations of both ubiquinone and tocopherol. The level of ubiquinone in the powerful pectoral muscle of the pigeon is particularly interesting in view of the very high metabolic activity of this tissue (which is known to contain high levels of other enzymes and co-factors concerned with oxidation): it is quite an exceptional concentration compared with those found in muscles of other species we have examined. The uniformly high levels of ubiquinone in all the tissues of the canary can also be related to the high basal metabolism in this species[8]. On chromatographic examination, all the tissues of these birds, which were fed ordinary mixed diets, were found to contain only ubiquinone-50. However, other ubiquinones could easily be introduced into the tissues of the birds by feeding them diets containing yeasts, which contain lower isoprenologues of ubiquinone-50: in the latter case there was a marked difference in the isoprenologue pattern of the various avian tissues.

Table 1. Ubiquinone (UQ), Ubichromenol (UC) and Tocopherol (T) in the Tissues of Some Birds

Species	Tissue	UQ (μgm./gm.)	UC (μgm./gm.)	T (μgm./gm.)
Fowl	Heart	18	3	1·4
	Liver	13	1	0·9
	Breast muscle	1·4	0·2	1·5
Pigeon	Heart	192	12	6·8
	Liver	47	not detected	15·4
	Breast muscle	136	8	0·6
	Gizzard	3	0·2	1·4
Canary	Heart	242	17	17·9
	Liver	52	3	8·0
	Breast muscle	38	3	5·0
	Gizzard	43	4	3·9

Although these results are preliminary in some respects, they are not without significance, and tend to support the concept that there is a relationship between tocopherol, ubiquinone and oxidation processes in animals. Although the three species examined were not on identical diets and the latter may have differed somewhat in vitamin E content, this is a factor that, as Edwin *et al.*[4] have shown, has only a minor bearing on the concentration of tocopherol accumulated by the tissues. The differences described in Table 1 undoubtedly reflect real species variations. The role of vitamin E and selenium in the control of ubiquinone in avian species will be discussed in a more detailed report elsewhere.

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Metabolism of *Gerbillus pyramidum*

The genus *Gerbillus* comprises about thirty species which are distributed throughout Africa. *G. pyramidum* or the greater Egyptian gerbil, as it is also called, is found in Arabia, across North Africa to Morocco on the west and down eastern Africa through the Anglo-Egyptian Sudan to Kenya and Tanganyika[1].

The species discussed in this communication, *G. pyramidum*, differs somewhat from the Mongolian gerbil, *Meriones unguiculatus*, in that it is a larger and heavier animal with a less-docile temperament.

Because there are geographical and climatological differences in the habitats of the two species, inherent differences in their energy metabolism and body temperature regulation might also occur.

Oxygen consumption was measured by means of a closed circuit apparatus which incorporated a commercial recording servo-spirometer (Mouse Spirometer, model 160, Custom Engineering and Development Co., St. Louis, Missouri).

Twenty-one animals were used in the metabolic phase of this investigation, ten males and eleven females, ranging in weight from 72 to 145 gm. The conditions under which the oxygen consumption was measured are those described in a previous paper dealing with the Mongolian gerbil, *Meriones unguiculatus*[2]. The animal was housed, during the test