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The respiratory quotient in diabetes.

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Oxidation of protein in the body really consists in the destruction of a great variety of amino-acids. When glucose arises from protein in diabetes the oxidation is different from the normal. When the D : N ratio is 3.65 the respiratory quotient for protein falls from 0.801 to 0.634. From Osborne's analyses of meat protein, recalculated on the basis of Osborne's own determination of the deficiency of the analytical methods employed, it may be calculated that the six sugar-forming amino-acids, glycocoll, alanine, aspartic acid, glutamic acid, proline and arginine, are present to the amount of 64.5 grams in 100 grams of meat protein. From the work of Ringer and Lusk and of Dakin and Dudley, it may be estimated that 44.4 grams of glucose arise from the several quantities of these amino-acids contained in 100 grams of meat. This would indicate a D : N of 2.75 and would explain the origin of 76 per cent. of the maximal sugar production from protein.

The estimated quantity of 64.5 grams of sugar-forming amino-acids would yield a respiratory quotient of 0.915 when oxidized normally, but if 44.4 grams of glucose be produced from them the respiratory quotient sinks to 0.675.

If one subtracts the influence of these sugar-forming amino-acids and the influence of the 1.07 grams of protein ammonia from the normal respiratory exchange, one may calculate that the respiratory quotient which represents the oxidation of the non-sugar-forming amino-acids is 0.716.

If one turns to Osborne's analyses it is found that the non-sugar-forming amino-acids consist in larger part (20 grams) of leucine, lysine and valine with respiratory quotients of 0.73, 0.71, 0.75 and in lesser quantity (7 grams) of histidine, phenyl-alanine and tyrosine with quotients of 0.90, 0.87, 0.89. Using Osborne's uncorrected figures (for corrections for lysine are not

available) one may estimate that in 100 grams of meat there are 27.16 grams of these six non-sugar-producing acids which on normal oxidation yield a respiratory quotient of 0.765 instead of 0.716 which was calculated. The lack of exact correspondence shows the comparative crudeness of the methods involved. It must also be remembered that the quantities present in meat of cystine and especially of serine, both of which are sugar formers, are unknown.

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On a simple method of diagnosing pregnancy, based upon the presence of specific enzymes in the urine.

By **R. H. MALONE, M.D.**

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It has been clearly demonstrated by Abderhalden and the host of workers following in his footsteps, that protective enzymes are developed in the body as a result of the presence of a foreign protein in the blood stream, whether that protein be derived from placental tissue, or carcinoma in the body, or be introduced from without for experimental purposes.

These enzymes, proteolytic in nature, have been found in the serum: their function is to digest the foreign protein and split it into amino-acids, in which form it may properly circulate in the blood stream, and be absorbed by the cells.

While working with Dr. A. A. Bruère at the Royal Victoria Hospital, Montreal, on a method of performing the Abderhalden Cancer test without the use of dialyzing thimbles, it was observed that a serum which gave a strongly positive test after incubation for 20 hours, was negative on the following day. The suggestion was made that certain enzymes had dialyzed out, causing the further splitting of peptone and amino-acids into simpler bodies which would not give the Ninhydrin reaction. Theoretically one might now expect that an enzyme which is dialyzable through a parchment thimble would also pass through the kidney and be found in the urine.

It was at this stage that Professor Adami called my attention