much as in the liver. The stomach content (milk) lipids contained significantly less of both the essential fatty acids and their longer-chain metabolic derivatives.

In the liver lipids of rats fed on completely fat-free diets eicosatrienoate/arachidonate ratios greater than 3 have been reported (Holman, 1968). Our results show that considerable morphological changes took place in these pups before this characteristic fatty acid pattern became established.

Holman, R. T. (1968) *Progr. Chem. Fats Other Lipids* **9**, 275

Urinary Sugar Excretion Related to Lactose and Sucrose Intake in Normal Children

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The excretion of disaccharides in the urine of children suffering from certain gastrointestinal disorders has been recognized for many years (Bickel, 1961; Gryboski *et al.*, 1963). More recently, interest in this phenomenon has been increased by the observation that it occurs particularly when intestinal disaccharide hydrolysis is impaired. Several authors have emphasized the relationship between excretion and intake of sugar (Folin & Berglund, 1922; Utter, 1927; Haworth, 1960). The data at present available are difficult to evaluate because test conditions and the presentation of results vary considerably from author to author.

Disaccharide loading tests were successfully completed on 300 'normal' children aged between 2.5 and 13 years and having a normal weight distribution (11–55 kg) who were awaiting tonsillectomy. A baseline specimen (early morning) and all the urine passed in the 5 h period after the load were collected and the sugars were determined quantitatively by paper chromatography (Menzies & Seakins, 1969). The period of collection was based on the observations made by Utter (1927) and McCance & Madders (1930).

In the first group, when the concentration of lactose or sucrose (25–40 g) was not controlled 60% of the children failed to excrete either disaccharide, and 50% either fructose or galactose. When the two disaccharides were combined (20 g each) none of the subjects excreted either, but when the load was increased (30 g each) 20% of the subjects excreted the disaccharides.

In the second group, when the concentration of sucrose (30 g) was varied between 20 and 70 g/100 ml sucrose excretion increased with increasing concentration, particularly in the range 50–70 g/100 ml.

Except at the lowest end of the quantity-concentration range, the administration of lactose and sucrose (20 or 30 g each), mixed in the same solution in concentrations of 20, 25 and 30 g/100 ml, produced an increase in the mean excretion of both disaccharides compared with that given by either disaccharide alone in the same amount and concentration. In two-thirds of the subjects sucrose excretion exceeded that of lactose by up to 400 mg/5 h.

These results confirm the pioneer work of Utter (1927) on the effect of disaccharide concentration and extend Moncrieff's (1960) observations on the administration of mixtures of disaccharides. Despite statements to the contrary (Lindemann & Solomon, 1962), lactose and sucrose can cross the mucous membranes of the normal gastrointestinal tract.

Bickel, H. (1961) *J. Pediat.* **59**, 641

Folin, O. & Berglund, H. (1922) *J. Biol. Chem.* **51**, 213

Gryboski, J. D., Thayer, W. R., Gabrielson, I. W. & Spiro, H. M. (1963) *Gastroenterology* **45**, 633

Haworth, J. C. (1960) *Arch. Dis. Childhood* **35**, 552

Lindemann, B. & Solomon, A. K. (1962) *J. Gen. Physiol.* **45**, 801

McCance, R. A. & Madders, K. (1930) *Biochem. J.* **24**, 795

Menzies, I. S. & Seakins, J. W. T. (1969) in *Chromatographic and Electrophoretic Techniques* (Smith, I., ed.), p. 310, Heinemann, London

Moncrieff, A. (1960) *Maandschr. Kindergeneesk.* **28**, 51

Utter, O. (1927) *Finska Läkarsällskapets Handlingar* **69**, 613

Alimentary Disacchariduria in Adults Related to the Osmolality of Ingested Solutions

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The observation that disacchariduria in children can be increased by addition of other sugars to an oral disaccharide load (Moncrieff, 1960; Menzies & Seakins, 1969) may indicate the effect of mechanisms relevant to the interpretation of disacchariduria, especially in gastrointestinal disease.

Factors influencing alimentary disacchariduria were studied by observing the effects of varying the disaccharide quantity and concentration in, and addition of other sugars and solutes to, oral loads in a group of normal starving adults. Quantitative determination of sugars in urine was performed by paper chromatography and direct scanning (I. S. Menzies, unpublished work).

As with children, admixture of sucrose and lactose, when raised above a certain concentration (40 g/133 ml each), progressively increased the 5 h urinary excretion of both disaccharides compared with that after either disaccharide given alone in the same amount and concentration.