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Information obtainable from transmission measurements of carbohydrates in the range from 200 to 1700 nm using water, heavy water (D_20) or dimethylsulfoxide (DMSO) as solvents.

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In the area of the destruction-free NIR analysis of fruit and vegetables development has not yet progressed as far as in grain and similar products. One reason for that is, that in contrast to grains, in fruit and vegetables water appears as the outstanding main-component making up typically 80% by weight of the fruit. Of the NIR absorption spectrum of pure water the bands at 1450, 970 and 760 nm are the first, second and third overtones respectively of O-H stretch while those at 1940 and 1190 are combination bands involving O-H stretch and O-H bend. The choice of band for spectrometry is governed by considerations of
sensitivity and selectivity. The overtone bands are satisfactory for use in moisture measurements from 0 to 4 % depending on path length. Measurements in fruits and vegetables at wavelength areas that are also important for the determination of carbohydrates (sucrose, glucose, fructose) often lead to total absorption in the presence of significant water even if short path lengths are possible. In this work model systems are used containing different carbohydrates in solvents like heavy water (D_20) or dimethylsulfoxide (DMSO) that do not contain O-H functional groups.