There has been much debate on the relative risks (sunburn and skin cancer) and benefits (vitamin D synthesis) of sun exposure, specifically at the ultraviolet (UV) end of the spectrum. Acute excess exposure can be easily identified visually. It is less easy to determine a lower limit of exposure that will allow for vitamin D synthesis. There is no simple indicator that vitamin D has been synthesised in the skin, and the variables that determine adequate vitamin D synthesis are even more numerous than those determining sunburn, and include the definition of adequate vitamin D. We show how carefully controlled experimental UV exposure studies enabled us to mimic real life within strictly defined boundaries, so that we have been able to quantify the change in vitamin D status at a known dose of UV radiation during a simulated summer. Detailed spectral measurements of the experimental radiation regime allow us to use radiative transfer modelling to translate the results of our experimental UV exposures into simple real life situations. Since the combination of the atmospheric conditions, the local environment and human behaviour are infinitely variable there are caveats attached to our calculations. Nonetheless, they enable us to provide indications of the exposure time required, in sunlight, at various locations, to achieve and maintain selected levels of circulating 25-hydroxyvitamin D, the measure of vitamin D status.