On surfaces of revolution with periodic mean curvature

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We study surfaces of revolution M in R^3 whose mean curvature are periodic functions on the axis of revolution of M. Since they are not periodic in general, we find a criterion in terms of the mean curvature for the surface M to be periodic, and then we show how to find these periodic surfaces of revolution. Our main result says that (1) any closed plane curve with the curvature k produces a 1-parameter family of periodic surfaces of revolution with the same mean curvature $k/2$, and (2) there are complete, non-periodic plane curves that make isolated periodic surfaces of revolution.