Let $H$ be a $k$-uniform hypergraph on $n$ vertices where $n$ is a sufficiently large integer not divisible by $k$. We prove that if the minimum $(k-1)$-degree of $H$ is at least $\lfloor n/k \rfloor$, then $H$ contains a matching with $\lfloor n/k \rfloor$ edges. This confirms a conjecture of Rödl, Ruciński and Szemerédi, who proved that minimum $(k-1)$-degree $n/k + O(\log n)$ suffices. More generally, we show that $H$ contains a matching of size $d$ if its minimum codegree is $d < n/k$, which is also best possible. (Received July 12, 2014)