Degeneration of Fermat hypersurfaces in positive characteristic

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We work over an algebraically closed field k of positive characteristic p. Let q be a power of p. Let A be an $(n+1) \times (n+1)$ matrix with coefficients a_{ij} in k, and let X_A be a hypersurface of degree $q+1$ in the projective space P^n defined by $\sum a_{ij} x_i x_j^q = 0$. It is well-known that if the rank of A is $n+1$, the hypersurface X_A is projectively isomorphic to the Fermat hypersuface of degree $q+1$. We investigate the hypersurfaces X_A when the rank of A is n, and determine their projective isomorphism classes.