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Fatemeh Bagherzadeh and **Murray Bremner*** (bremner@math.usask.ca). *Cohomology of totally associative n -ary algebras.*

The cup product in the cohomology of an algebra over a quadratic operad has usually been considered only in an abstract setting, using Koszul duality, without explicit calculations in particular cases. For totally associative n -ary algebras, the cup product endows the cochain complex with the structure of a partially associative n -ary algebra. The defining relations for n -ary partial associativity depend on the parity of n . For $n = 2$, total and partial associativity coincide, and we obtain the classical cohomology theory of associative algebras. For $n = 3$ and $n = 4$, we provide an explicit definition of the cup product, and prove that it satisfies partial associativity. (Received August 17, 2018)