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In obesity and dyslipidemia, hydrolysis of triacylglycerol (TAG) into non-esterified fatty acids (NEFAs) may contribute to insulin resistance, and production of oxygenated, bioactive polyunsaturated fatty acids may increase oxidative stress. Here we show that after six weeks of high-fat feeding of obese prone rats (Crl:OP(CD)), vitamin C was increased both in liver (P<0.01) and plasma (P<0.001), while both TAG (P<0.01) and NEFA (P<0.001) were lower than in low-fat fed control rats. Hepatic vitamin C biosynthesis was similar between groups, indicating that a new steady state level was established with a higher vitamin C level adequate for supplying the systemic needs. Glucose and insulin sensitivity were unaffected at this stage. Eventually, the mobilization of vitamin C may be seen as a mechanism to protect the host against insulin resistance.