Nanosilver (nAg) has been incorporated into many consumer products, including clothing and washing machines, because of its antimicrobial properties. Consequently, the potential for its release into aquatic environments is of significant concern. Documented toxic effects on fish include altered gene expression, gill damage, and impaired gas exchange, as well as mortality at high nAg concentrations. The present study reports the effects of nAg on the metabolism of rainbow trout (Oncorhynchus mykiss). Fish were exposed to environmentally relevant concentrations (0.28 ± 0.02 μg/L) and higher (47.60 ± 5.13 μg/L) for 28 d, after which their standard metabolic rate (SMR), forced maximum metabolic rate (MMRf), and spontaneous maximum metabolic rate (MMRs) were measured. There was no effect observed in SMR, MMRf, or MMRs, suggesting that nAg is unlikely to directly affect fish metabolism. On average, MMRs tended to be greater than MMRf, and most MMRs occurred when room lighting increased. The timing of MMRf chase protocols was found to affect both MMRf and SMR estimates, in that chasing fish before respirometric experiments caused higher MMRf estimates and lower SMR estimates. Although compounded effects involving nAg and other environmental stressors remain unknown, the present study indicates that the tested range of nAg is unlikely to constrain fish metabolism.