Commercial broilers are exposed to a number of stressors prior to slaughter, including feed deprivation, crating density (high vs. low), and transportation. Hence, the individual and additive or overruling effects of these stressors on welfare and energy metabolism were examined. Live weight gain, rectal temperature, physiological responses, and meat quality of broilers were determined. The fasting of broilers before being transported resulted in a decrease of triglycerides, uric acid, and triiodothyronine concentrations, indicating a negative energy balance. Feed withdrawal was also associated with a reduction in body weight, and highest body weight losses were observed after being fasted for 13 h. For some parameters there was a combined effect of feed withdrawal and crating density, whereas for others the crating density overruled the effect of previous feed withdrawal: broilers that had no access to feed before being transported had higher thyroxine and lower lactate concentrations (only at high crating density) compared with their fed counterparts before the transport process, indicating the combined effect of both actions. The distinction due to the feeding pattern could no longer be observed for the plasma uric acid, nonesterified fatty acids, triglycerides, and triiodothyronine concentrations because it was overruled by the transport effect, especially if broilers were transported at high crating density. Plasma corticosterone concentrations increased as a consequence of the procedure of transportation and peaked if broilers were crated at high density. In our study, no significant effect of preslaughter stressors on meat quality, plasma creatine kinase activity, or lipid peroxidation levels were noticed. It can be concluded that transportation at high stocking densities should be avoided to reduce economic losses and stress to broilers. Plasma hormone as well as metabolites, rectal temperature, and heat shock protein 70mRNA all indicated the high stress level of broilers. Furthermore, this effect often overruled the feed withdrawal and transport effect, indicating the importance of crating density.