TABLE 3. *Estimated standard molar enthalpy change of cellular reactions*

| Reaction | $-\Delta H°$ | |
|---|---|---|
| | kJ/mol | kJ/mol O |
| *a*: Glucose + 12 O → 6 $CO_2$ + 6 $H_2O$ | 2,803 | 234 |
| *b*: Palmitate + 46 O → 16 $CO_2$ + 16 $H_2O$ | 10,014 | 218 |
| *c*: Lactate + 6 O → 3 $CO_2$ + 3 $H_2O$ | 1,367 | 228 |
| *d*: $NADH_2$ + O → $NAD^+$ + $H_2O$ | 256 | 256 |
| *e*: ATP + $H_2O$ → ADP + $P_i$ | 20 | 40 |
| *f*: $H^+_{out}$ → $H^+_{in}$ (mitochondria) | 15 | 150 |
| *g*: Succinate + O → fumarate + $H_2O$ | 152 | 152 |

Enthalpy changes ($\Delta H°$) at 25°C are calculated for reactions as shown and per mole of atomic oxygen. All enthalpies are negative. Values do not include buffer ionization or metal binding. Enthalpy changes for *reactions a–c* are from Blaxter (15), and those for *reaction d* are from Poe et al. (163) and Burton (42). Standard enthalpy changes for *reaction e* are from Podolsky and Morales (162) and are corrected for buffer ionization. Enthalpy of ATP hydrolysis per atom of oxygen is calculated assuming a ATP/O of 2. $\Delta H$ including buffer ionization has been estimated to be 47 kJ/mol ATP in muscle (58) and 15 kJ/mol (11). For *reaction f*, values for mitochondrial proton transport are enthalpy equivalent of mitochondrial membrane potential taken as 150 mV, and value per mole of atomic oxygen is calculated assuming a $H^+$/O of 10 (see text).