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Lower redness of the facial skin is a marker of a positive human-hen relationship

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In certain mammals, facial expressions are reliable markers of the emotional state of an individual. In humans and parrots, emotional stimuli can induce a rapid change of face colour that is linked to blood flow. The aim of this study was to test whether the redness of the face in domestic hens could be used as an emotional marker in the context of the human-hen relationship. Two groups of hens (Sussex) were studied: a group habituated to a human with daily positive interaction (n=13) and a non-habituated group (n=12). Behaviour and skin colour of wattles, cheeks, ear lobes and comb, were analysed from two video-recorded tests (novel environment and reactivity to human tests) conducted after 5 and 6 weeks of habituation. In the novel environment test, usually used for testing general underlying fearfulness, the hens were tested alone in an unknown environment. In the reactivity to human test, the hens were tested again in this environment but with the familiar human sitting inside. The human presence should only be stressful for the non-habituated group. As expected, the behaviour of the two groups did not differ during the novel environment test. During the reactivity to human test, the habituated hens were more relaxed than the non-habituated hens: they took their first step faster ($p=0.03$), came faster into contact with the human ($p=0.03$), explored him longer ($p=0.0003$) and displayed more comfort behaviours ($p=0.01$). Face redness differed between the two groups during only the reactivity to human test: lower redness was observed in habituated hens for 3 out of the 4 regions (wattles $p=0.01$, cheeks $p<0.0001$, ear lobes $p=0.0003$). These results show that more relaxed hens are less red, thus face redness could be a reliable marker of the quality of the human-hen relationship. As such, it could be used as a tool for human to infer the emotional state of hens and more broadly, to evaluate their welfare.