**A protistan-focused gut microbiome survey of UK residents favours high vs low nutrient diets: a retrospective study**

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**Abstract (Max 300 words):** Gut microbiome dysbiosis has been shown to negatively affect overall health and well being, with protistan denizens playing an important role. Both protein and complex carbohydrate composition of diet has been implicated in gut microbiome composition, but this has never been assessed in a comparative temporal study. Here we utilize high-throughout sequencing and spectral analysis to comparatively study a cohort of individuals from London, UK, from 1820-1860. Initial studies of gut microbiomes assessed via 18s and 16s community diversity were undertaken on a low nutrient diet at 3 time points (i.e. XmsPst, XmsPrsnt, XmsFtr). Specific signals for balanced communities of red and green algal lineages, eg. *C. decoration* and *Y. cheer* respectively were assayed. Poor overall physical and mental health of individuals was observed along with low diversity of gut microbiome, specifically noting an absence of stramenopiles with tinselated flagella. After these preliminary data were deemed unsatisfactory by an external panel of reviewers, spectral analysis was applied and the time points resampled under high protein diets, consisting of the addition of heat-treated *Ancer domesticus* plus or minus a complex carbohydrate matrix saturated with 40% ethanol solution (FC +/-) conditions. Increased gut microbiome complexity and increased protistan diversity was significantly correlated with physical and mental health under high nutrient conditions. Possible error may derive from the technical need to use different sequencing platforms for the different time points, XmsPst=sanger sequencing, XmsPrsnt=short-read, XmsFtr=long-read. However, comparable sequencing depth was applied and so this systematic error should be minimal. Moreover, repetition of the protocol is not recommended due to health and safety concerns involving exposure to unknown sources of tachyon radiation. Overall, we recommend that high nutrient diets be consumed for maximal physical, mental and microbiome health and that protistan diversity is a reliable marker for good cheer.