

INFLUENCE OF NUTRIENT REQUIREMENTS ON ACTIVITY BUDGET AND MOVEMENTS PATTERNS IN PRIMATES

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Collective decision making and especially leadership in groups are among the most studied topics in natural, social, and political sciences. Previous studies showed that some individuals are more likely to be leaders because of their social power or the pertinent information they possess. One challenge for all group members, however, is to satisfy their needs. We do not yet know how individuals share out the leadership between them in order to satisfy all individual requirements. Here, we build a dynamic model where groups of ten individuals had to satisfy five different needs (proteins, energy, water, socializing and resting), but did not know each other's needs. Group composition and individual characteristics (nutrient needs, expenditures and intakes) are based on data on macaques. An individual decides for all its conspecifics as long as it possesses the highest motivation. Simulations showed that the system – leadership by those in need – is sustainable. All individual requirements are satisfied at the end of simulations, whatever the group composition. Moreover, the group activity budget is fairly similar to the activity budget of wild primate groups. We have similar results with the daily path length and movement patterns. This simple rule leads to a viable decision-making system where all individuals may lead the group at one moment and thus suit their requirements. This outcome may make important contributions to our understanding of decision making in animal and human societies.

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