



CALIFORNIA STATE SCIENCE FAIR  
2002 PROJECT SUMMARY

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<b>Project Title</b> Ants: Foraging Communication	
<b>Objectives/Goals</b> My question was (1) can Argentine ants communicate the size of a bait, and (2) what happens during the recruitment process? Since Argentines are known as fast to discover food resources, quick to recruit, and possessing the numbers to retrieve large food resources, they could also recognize and communicate the size of a bait. <b>Abstract</b> <b>Methods/Materials</b> (Experiment 1) Using different weights of tuna baits (.1g, 1g, 10g) at separate times, I counted the number of ants every 5 minutes for 45 minutes after bait discovery. This was repeated 7 times for each bait size during the 5am -10 am time block, 7 for 11 am- 4 pm, and 7 for 5 pm - 10 pm. (Experiment 2) Using different base area tuna baits (1/8 inch <sup>2</sup> , 1/4 inch <sup>2</sup> , 1/2 inch <sup>2</sup> ), I counted the number of ants in a highlighted region every 5 minutes for 45 minutes after bait discovery. (Experiment 3) Using different base area tuna baits (1/8 inch <sup>2</sup> , 1/4 inch <sup>2</sup> , 1/2 inch <sup>2</sup> ) I observed the ants according to 23 categories of response in a highlighted region every 15 minutes for 45 minutes after bait discovery, then every 30 minutes for the next 4 hours. <b>Results</b> The Argentines consistently recruited more ants faster to the relatively larger baits. During recruitment, I found three discernable stages: Stage 1, "Discovery," occurs when the bait is 0-30% covered, Stage 2, "Recruitment," when the bait is 31-79% covered, Stage 3, "Retrieval," when the bait is 80-100% covered. <b>Conclusions/Discussion</b> The Argentines recruit more numbers faster to the relatively larger baits, which suggests that the recruitment process begins with a recognition of bait size. It's possible that the ants' circling explorations around all sizes of bait are linked to estimation of bait size. In addition, the recruitment process seems to be guided by the percent of the bait covered, so that the recruitment process abates when the bait is covered 80-100% as in response to a simple stimulus.	
<b>Summary Statement</b> My project researched the foraging communication and recruitment process of Argentine ants.	
<b>Help Received</b> Mother helped photograph ants, take me to Gordon Labs, Stanford, drive to annual conference of Entomological Society of America, San Diego.	