

FUTURES EVALUATION REPORT

Prepared for Yolo Farm to Fork

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Gail Feenstra and Shosha Capps

UC Sustainable Agriculture Research & Education Program



SUMMARY of FUTURES EDIBLE GARDEN GRANT

In 2014, the Orchard Hill Foundation granted \$60,000 to Yolo Farm to Fork so they could provide mini grants, technical assistance and outreach to support six school gardens in Yolo County. The grant also helped connect students' garden learning experiences with classroom instruction, helped students grow and taste at least 5 different fresh produce items, implemented tasting events at each school's Back to School Night in September 2014 and conducted pre/post surveys with students about their produce preferences as a result of the project.

SUMMARY of EVALUATION PLAN

UC SAREP worked with the Futures Garden Coordinator to design evaluation strategies to measure program outcomes. In this report, we summarize garden activities reported at each school. We also summarize and analyze pre/post data about changes in student preferences and taste testing of garden produce.

Specifically, for each of the 6 edible school gardens selected to participate, we evaluated:

Participation in edible school garden

- Number of students and teachers participating in the garden activities
- Descriptions of what activities occur at each garden, describe what is grown, describe linkages to classroom instruction.
- Number of community volunteers who helped sustain edible gardens over the summer

Garden tasting

- Number of students tasting garden produce.
- Number of students and parents participating in Tasting Event at Back to School Night in September

Preferences for produce

- Evaluate pre/post student surveys to determine if preferences for selected produce (namely, products grown in the garden) items change during the course of the project.

RESULTS

Participation in Edible School Gardens

Number of students and teachers participating in garden activities

Over 1000 students participated in garden and produce tasting activities this year, led by teachers and volunteers at six participating elementary schools.

Zamora Elementary (Woodland): 150 students, 0 teachers (volunteer only)

Dingle Elementary (Woodland): 195 students, 1 teacher

Plainfield Elementary (Woodland): 310 students, 1 teacher

Beamer Elementary (Woodland): 130 students, 14 teachers

Southport Elementary (West Sacramento): 60 students, 2 teachers

Marguerite Montgomery Elementary (Davis): 250 students, 2 teachers

Activities, crops, and links to the classroom

Zamora Elementary

Zamora Elementary held 55 garden sessions in K-2nd grade classes between February and May of 2014. Participating students tended the garden and tasted a variety of fruits and vegetables that they grew and harvested themselves. The garden included a variety of spring and summer annual fruits, vegetables, and greens, as well as approximately 15 fruit trees. Garden activities were connected to classroom lessons in math and language arts.

Dingle Elementary

Six 4th-6th grade classes at Dingle Elementary spent a half day each week in the garden from February to May of 2014. Garden lessons were led by a UCD student intern who also hosted a garden club on Monday afternoons. The Dingle garden grew a wide variety of spring and summer vegetables, fruits, greens, herbs, and even beans and sunflowers. Work in the garden was connected to classroom journaling exercises, biology, math, and lessons about the culinary and medicinal use of herbs.

Plainfield Elementary

Eleven classes attended weekly garden sessions in which students tended, harvested, cooked, and tasted produce from the garden. Crops grown included fruit trees, spring and summer vegetable

and fruit crops, peanuts, amaranth, artichokes, and a diverse range of herbs and edible flowers. Garden activities were linked to classroom lessons in science, reading and writing, and art.

Beamer Elementary

At Beamer Elementary, 2nd-6th grade classes participated regularly in the garden, including basic garden maintenance, bug hunts, seed saving activities, and tasting events including salsa and salad. Garden participants grew a variety of herbs and annual fruit and vegetable crops, as well as sunflowers for seeds. Classroom connections were primarily in the form of art projects with pressed flowers and seeds.

Southport Elementary

Students from 2nd-4th grade classrooms at Southport Elementary built new planter boxes, made beds of old tires, and grew lettuce, tomatoes, melons, bell peppers, jalapeno peppers, cucumbers, and marigolds in their garden. A leadership class helped with tasting and garden tour events.

Marguerite Montgomery

Six 1st – 3rd grade classes had weekly or biweekly garden classes in addition to a garden club that met at recess three times per week. Garden activities took place in an edible garden, a California native plants garden, a pollinator garden, and an herb garden. Students grew a variety of unusual varieties and colors of vegetables, herbs (some for teas) and tended several fruit trees (peach, lemon, persimmon, kumquat). Nutrition, art, and sciences classes were integrated with garden activities.

All garden programs had a strong tasting component. In addition to tastings during weekly gardening activities, many schools also had larger tasting events, either school-wide (at Plainfield and Beamer) or for outside guests (Southpoint and Marguerite Montgomery).

Community volunteers over the summer

Gardens were maintained over the summer with the help of parents, volunteers and interns. Volunteers and interns from UC Davis, Centennial Rotary Club, and a local Girl Scout troupe helped at different schools. Dedicated school families were instrumental in keeping gardens going over the summer break.

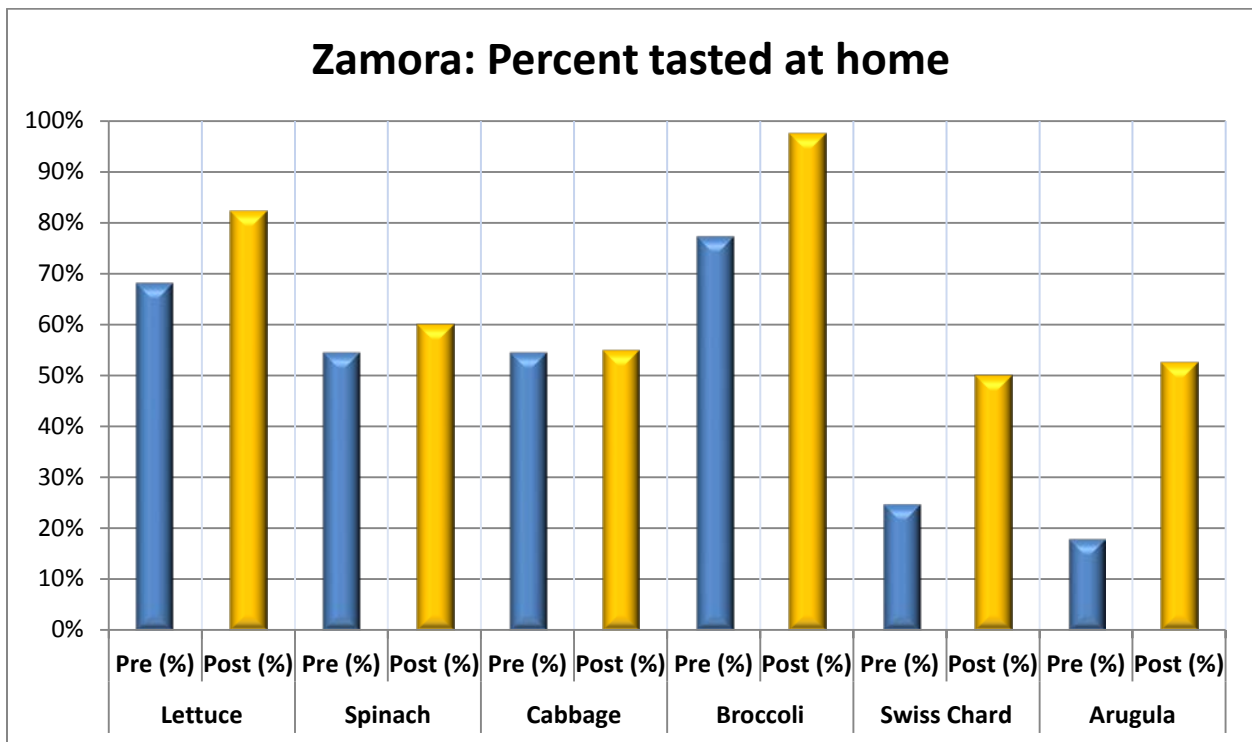
Garden Tasting and Preferences for Produce

As part of the project, students were invited to taste particular fresh produce items at home and at school before the gardens were harvested and after. They were also asked about how much they preferred each produce item (like/love, don't like, didn't taste). The same produce items were sampled in each of the six school gardens: lettuce, spinach, cabbage, broccoli, swiss chard and arugula. The Garden Coordinator planned to collect data on how many students were willing to taste each produce item and their preferences before and after harvest. Due to a misunderstanding about data collection, only Zamora students were surveyed about willingness to taste and preferences at the beginning of the project (February/March) and after the garden was harvested in May/June (before school ended). All of the other 5 schools were surveyed in the spring before harvest and then not again until the fall (post- harvest), at the beginning of the next school year.

ZAMORA (K-2nd grade)

We will focus on the Zamora results first since these most closely reflect the way data were supposed to be collected and probably are more accurate in terms of real outcomes.

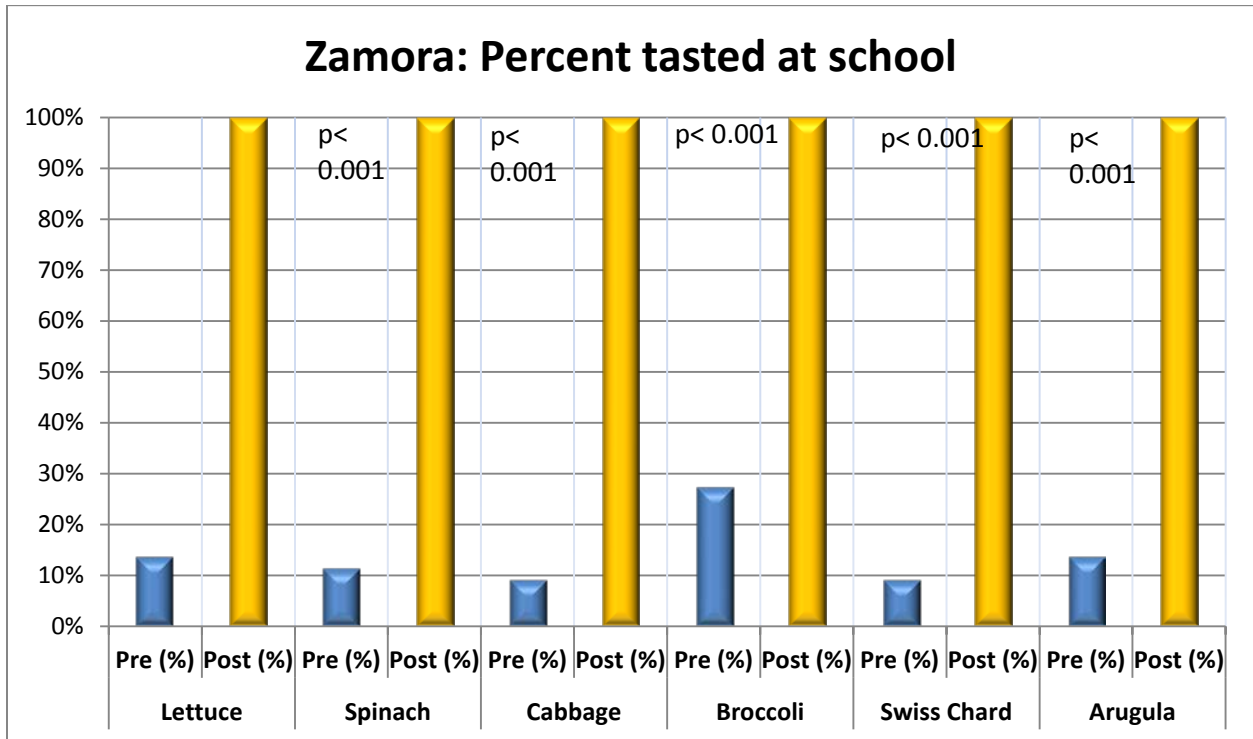
For each produce item, we asked whether students were willing to taste that item at home and at school. We also asked whether students liked it. The graph below shows how Zamora students responded to tasting at home:



	Lettuce		Spinach		Cabbage		Broccoli		Swiss Chard		Arugula	
	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)
Tasted at home	68%	83%	55%	60%	55%	55%	77%	98%	25%	50%	18%	53%

Tasting at home increased for every produce item, although the difference was only statistically significant (difference due to garden, not chance) for broccoli, swiss chard and arugula.

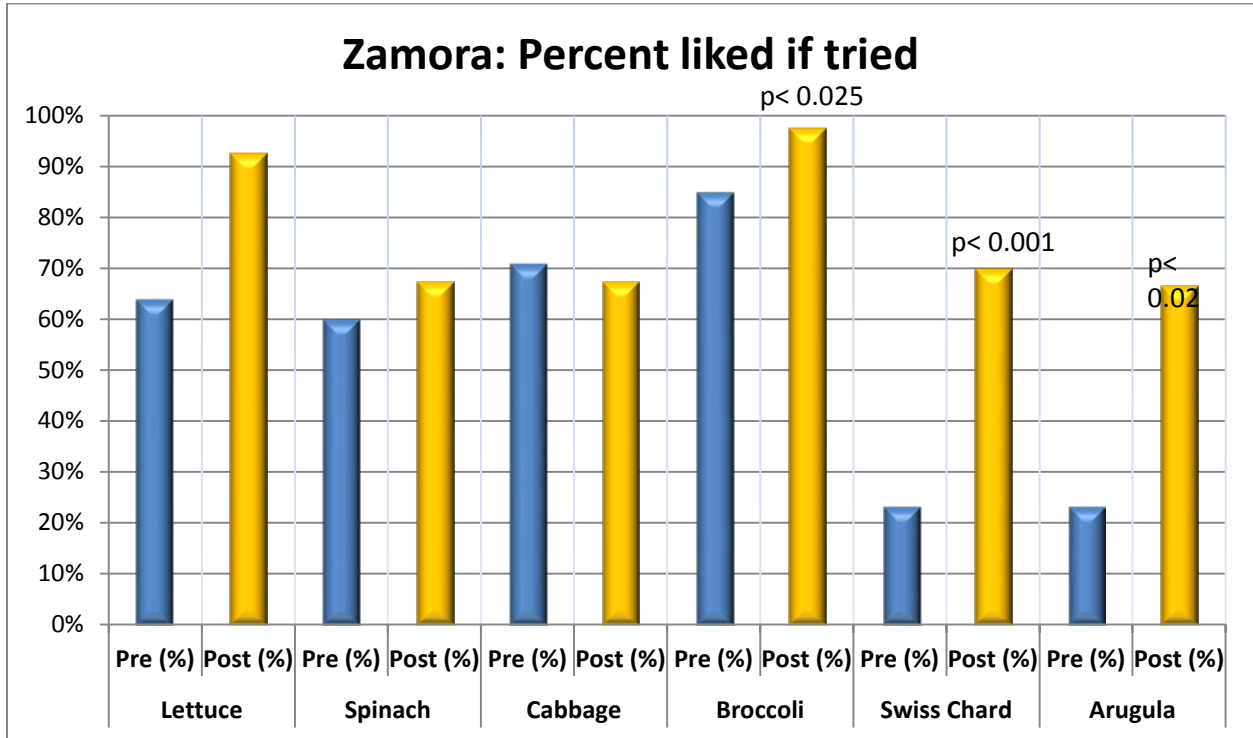
The graph below shows how Zamora students responded to tasting at school:



	Lettuce		Spinach		Cabbage		Broccoli		Swiss Chard		Arugula	
	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)
Tasted at school	14%	100%	11%	100%	9%	100%	27%	100%	9%	100%	14%	100%

Not only did tasting at school increase dramatically, but the difference was statistically significant for each produce item.

Finally, we asked whether students liked/loved each item IF they had tasted it. The results are below:



	Lettuce		Spinach		Cabbage		Broccoli		Swiss Chard		Arugula		
	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	Pre (%)	Post (%)	
% Liked if tried (pref)	64%	93%	60%	68%	71%	67%	68%	85%	98%	24%	70%	24%	67%

Student preferences increased for almost every produce item and were significantly different for broccoli, swiss chard and arugula.

Comments/Interpretation

The most dramatic increases were for tasting produce at school. This is not so surprising since children were asked to taste these items immediately after harvest when they were in the garden and most were probably eager to try them. Being willing to taste these vegetables at home is even more important since it most likely involves other family members. Broccoli, swiss chard, and especially arugula, are not commonly liked vegetables for young children. The fact that the garden influenced them to taste and to like these vegetables is important. Moreover, the Zamora students were K-2nd grade. If garden activities can influence what these youngest children eat, it sets the stage for future healthful eating.

DINGLE (4th-6th grades)

For Dingle, results were much less dramatic. In fact, there was very little change from pre to post harvest. The only statistically significant change was an increase in willingness to taste lettuce at home, and a tendency (not quite statistically significant) to taste broccoli at home. This school was measuring changes for grades 4-6. This age group may be more reticent to try new

things or be more influenced by their peers. This suggests that starting gardens and vegetable taste testing at earlier grades might be better than late elementary. [For more information, see attached spreadsheet with charts and graphs for each school]

BEAMER (2nd-6th grades)

Beamers's results (2nd – 6th graders) were also only marginally changed. The interesting thing for Beamer was that broccoli and arugula seemed to have the greatest changes. Willingness to taste broccoli at home and at school was significantly different; willingness to taste arugula at school was significantly different, as was an increase in preference. The other vegetables showed no change. It should be noted, however, that for lettuce, almost everyone had tasted it at home and at school BEFORE the garden harvest, so large changes were not possible. [For more information, see attached spreadsheet with charts and graphs for each school].

SOUTHPORT (4th-5th grades)

Results for Southport (4th-5th grade) were disappointing. There were 2 significant changes—willingness to taste spinach and cabbage at home. There were no other significant changes. A number of factors likely contributed to these results: (1) post-tests were done in the fall when students likely forgot some of what they grew; (2) students may have been influenced by peers; (3) the garden investment and activities conducted in the garden was less than in other schools. [For more information, see attached spreadsheet with charts and graphs for each school].

MONTGOMERY (3rd-4th grades)

Results for Montgomery were more positive. Tasting at school significantly increased for broccoli, swiss chard and arugula. Tasting at home only increased significantly for arugula; however, it should be noted that for lettuce, spinach, cabbage and broccoli, the majority of students (more than 85%) had already tasted these vegetables. Student preferences increased for cabbage and arugula. In this school, arugula seemed to be quite popular. The garden program in this school was strong, so there was a lot of exposure to the garden and a lot of garden activities. [For more information, see attached spreadsheet with charts and graphs for each school].

PLAINFIELD (5th-6th grades; 2/3 – 3/4 grades; 1st-2nd grades)

Three classes were surveyed at Plainfield, which has a very strong garden program. Results for Grade 5/6 and for Grades 2/3 – 3/4 were fairly good; results for Grade 1/2 were very disappointing. We believe that, especially for very young children, surveying them in the fall about activities that happened the previous spring, does not work well. For the 5/6 graders, students were more willing to taste spinach, swiss chard and arugula at home after the garden harvest. They were more willing to taste lettuce, spinach and arugula at school after the garden harvest. There were no changes in preferences. For grades 2/3 – 3/4, students were more willing to taste every vegetable except cabbage and arugula at home and more willing to taste lettuce, and arugula at school. There were no changes in preferences. [For more information, see attached spreadsheet with charts and graphs for each school].

Parent Surveys at Fall Tasting Events

Parents were surveyed at the fall tasting events at each school. The table below describes the results from the survey for all schools. A total of 71 parents from all 6 schools were surveyed, although not all parents answered each question. N (in the table below) indicates the number of parents that answered each question. “Total” means the total score for that question. The average score is much more meaningful because it can be compared to the scale (1-5). The first three questions solicit the parents’ opinions about their child’s experience in the garden. The last two questions summarize how well the parents liked the Tasting Event itself.

Questions 1 and 3 and 4 used a Likert scale (1 = low interest, did not like; 5 = high interest, liked very much). The average scores show how close to the highest score (5) each response came. Questions 2 and 3 can be summarized by how many parents answered in the affirmative. For example, 68% of parents said their child has asked for a veggie grown in the garden at home. Ninety-three percent said they would come to another tasting event.

For more specific information on each school’s responses, see attached spreadsheet with charts for each school.

<i>ALL SCHOOLS</i>				
	<i>N</i>	<i>Total</i>	<i>Ave Score (1-5)</i>	<i>Percent</i>
	71			
1. Child enjoyed the garden	70	336	4.80	
2. Asked for veggies grown in garden	71	48		68%
3. Important that their child participated in garden	70	332	4.74	
4. Liked tasting event	65	303	4.66	
5. Would come to another	68	63.5		93%

Comments

Most parents thought that their children enjoyed being in the garden. Responses varied somewhat by school. Montgomery had the lowest average score at 4.33; Dingle had the highest with an average score of 5.0. Zamora, with the outstanding tasting and preference scores, had an average score from parents of 4.73.

Sixty-eight percent of parents (about 2/3) said their child had asked for a vegetable grown in the garden (to eat at home). This ranged from a low of 50% at Dingle and Montgomery, to a high of 90% at Beamer. At Zamora, 55% of parents said their child asked for a veggie at home.

For the majority of parents, it was important that their child participated in the garden. This ranged from a low at Montgomery of 4.33 to a high of 4.88 at Plainfield. Zamora's average score for this question was 4.82.

The Tasting Events were generally well liked with an overall score of 4.66. This ranged from 4.2 at Southport to 4.92 at Plainfield. Zamora's score was 4.8. More than 90% of parents at all schools (93%) said they would like to attend another Tasting Event.

Overall Comments

These six school gardens provided a strong set of foundational experiences to elementary school children about how their food is grown, the connections to the natural world and to their own diets. When responses are measured immediately after the garden harvest (e.g. Zamora), it is clear that children are willing to taste and prefer garden produce. This experience fades over time, as evidenced by the responses in the other five schools. Where there are strong garden programs (Plainfield, Montgomery) with more exposure to garden activities, children seem to be more willing to taste and indeed, prefer more types of produce, at school and at home.

The results of this project also point to a couple of other potential findings that can be explored more in future. First, strengthening children's confidence and love for the garden and the food it produces, takes time. One year or one season is not enough. Children need multiple exposures over several years to develop an ongoing appreciation for what the garden has to offer and its relevance to their lives. Schools that incorporate these values into their curriculum from K-6 or K-8 are in a better position to significantly influence children's lives. Second, there seem to be many factors that contribute to children's willingness to taste fresh produce from the garden and their preferences. These might include the excitement and commitments of the teachers and parent volunteers; the number and types of activities engaged in and the amount of time spent in the garden; the support of parents; the support of other school personnel (principal, other teachers, school food service, etc.). We did not measure any of these systematically. Future evaluations might explore factors that contribute to successful school garden experiences for children and how or to what extent these factors are engaged at each school site. Understanding these factors can help these and other schools know what to focus on to make their school gardens work best and how to make them sustainable into the future.