



# USAID | MASFRIJOL

DEL PUEBLO DE LOS ESTADOS UNIDOS DE AMÉRICA

**Associate Award under the Feed the Future Innovation Lab for Collaborative Research on Grain Legumes**

**AID-EDH-A-00-07-00005**

**YEAR 3 REPORT: APRIL – SEPTEMBER 2016**



**With the collaboration of**



**MICHIGAN STATE UNIVERSITY**



## 1. Introduction

This six-month report on the MASFRIJOL project covers April through September 2016, during which MASFRIJOL has devoted significant time to the establishment of community seed depots (CSD) and advanced nutrition education agenda with very positive results. With the project in its fourth year, the past six months were used to set up the closing ramp. Key activities were

1. Dissemination of seed of improved bean varieties to new beneficiaries and a second wave of dissemination to households that experienced crop failure in the past;
2. Strong emphasis on the establishment of CSD for local seed production;
3. the completion of the nutrition assessment data collection conducted on beneficiary families with children under five years of age; and
4. Crosscutting education sessions and technical assistance to directly support the areas of work. It has been encouraging for the implementing team to achieve most of the project indicators at 80 percent or more. Although some indicators have lagged to make room for priorities with ACS, we remain confident that we will reach all of the project goals and enhance the impact of this initiative in the final months of the project.

In numbers, the accomplishments for the period April 1 – September 30, 2016, are highlighted below.

- **CSDs: 36** were established and harvested production during the first planting season of 2016. These CSDs were established in an equal number of communities in the target five WHIP departments. The experience of these CSDs has been highly positive and 19 new CSDs were organized and some planted during this reporting period. The results of their seed production performance will be closely monitored and reported.
- **Improved seed varieties: 4,094 pounds of** were produced and commercialized in the target communities by CSDs, with which 40.9ha can be planted, some in the second planting season and some later in 2017. The amount of seed available from CSDs is poised to increase as MASFRIJOL continues to expand on this community-based seed production model.
- **Seed of improved bean varieties: 8,000 bags of** have been delivered to partners for distribution to the same number of new beneficiary families, representing nearly 33,000 families that have received improved bean seed since the onset of the project. With an original goal of benefitting 25,000 families, this means we surpassed this indicator by 32 percent.
- **Trained technicians: 65 technicians** from the Ministries of Agriculture and Health and from collaborating projects in the WHIP area were trained in the fourth cross-training program (Agriculture and Nutrition) organized by MASFRIJOL and FANTA III.

- **Technicians: 15 producers and 8 technicians** were instructed during the second CSD model training course where seed production strategies, methods, and best practices were imparted. The course is required for aspiring CSD participants.
- **Agronomic Practices' Beneficiaries: 2,312** were trained on improved agronomic practices for bean production. With this, MASFRIJOL reached 80 percent of the goal of 12,000 beneficiaries trained.
- **Nutrition Information Beneficiaries: 3,400 beneficiaries** participated in at least one nutrition education/training session, bringing the project goal of 12,000 beneficiaries to 100 percent. The work will continue throughout the remainder of the project since many communities have not been reached and we continue to build momentum with the participation of MSPAS health educators to reach more families.
- **Recipe Demonstration Beneficiaries: 721 participated** in bean recipe demonstration sessions teaching families to enhance their diets with more bean consumption. With this number, MASFRIJOL has reached 108 percent of the goal of 2,000 beneficiaries for the life of the project.

## 2. Administrative Results

During the MASFRIJOL project decided to strengthen its technical team field office in order to maintain the momentum of activities in the localities covered by the project and thereby ensure that the project indicators continue reaching according to programmed into the Performance Monitoring Plan (PMP for its acronym in English). This decision involved hiring four new auxiliary technicians, so the MASFRIJOL team in each department includes an Ing. Agr. Extension (team leader) and two Technical Assistants.

During this reporting period, the MASFRIJOL project strengthened its technical team in order to maintain the momentum of activities in the localities. Our goal is to surpass the Performance Monitoring Plan (PMP) indicators and focus on the project's legacy to the communities. The team that supported our field activities included Peace Corp Response Volunteers (PCRV). During the first part of this reporting period, we relied on significant contributions from Ms. Rachel Uffer, a six-month volunteer who left in August; since her departure, we have acquired the services of Ms. Dorothea Vieira. Ms. Viera, a new PCRV, will be supporting MASFRIJOL for 12 months, offering training and experience, especially in nutrition-related activities.



Figure 1. Bean seed delivery to beneficiaries, Las Granadillas, San Juan Ostuncalco, Quetzaltenango.

### **3. Seed Dissemination Activities**

The dissemination of seed varieties adapted to the conditions of the target region for optimal productivity is one of the most strategic activities for demonstrating the difference in yields obtained with improved seed. As farmers corroborate improvements in productivity (versus landrace seed), their reports help establish a sustainable environment for community seed banks to produce and market their seed in the short, medium, and long term.

The following table illustrates the results of seed dissemination during this reporting period, which targeted new beneficiaries within the target communities and brought a second chance to families that had experienced previous crop failure due to climate-related problems.

Table 1 shows the institutions and/or partners who have received seed for distribution to beneficiaries during this reporting period. Forty-five percent of the seed was distributed in Huehuetenango, while San Marcos received 20.9 percent, Totonicapán 19.2 percent, Quiché 14.4 percent, and Quetzaltenango just 0.14 percent. The low level of dissemination in Quetzaltenango during this current period reflects the fact that most of the beneficiaries in that department's target municipalities have been reached. Table 2 illustrates the seed dissemination efforts by variety, providing support to the practice of targeting areas located at high altitudes with the appropriate genetic materials to ensure a successful harvest. ICTA Ligeró is the only variety disseminated with resistance to yellow mosaic virus, typically a strong disease in production areas up to 1500 meters and, therefore, more widely disseminated in the low valleys of Huehuetenango.

**Table 1. Seed Dissemination Activities with Partners April–September 2016**

SEED DELIVERED APRIL TO SEPTEMBER 2016 - HUEHUETENANGO DEPARTMENT-							
DATE (Delivery)	INSTITUTION	DESTINY	SEED DELIVERED APRIL-SEPTEMBER 2016				TOTAL
			ICTA S. Chiva	ICTA Altense	ICTA Hunapu	ICTA Ligero	
6/10/2016	ASODIME	La Estancia, Municipio de Huehuetenango	25	0	25	0	50
7/5/2016	Grupos de evaluacion nutricional	Varios comunidades de Huehuetenango	140	70	70	0	280
7/12/2016	ASOCUCH-CHIANTLA	Chiantla, Departamento de Huehuetenango	310	100	0	0	410
7/12/2016	ADIMAM	Cuilco	30	0	15	30	75
8/2/2016	FUNCAFE/ANACAFE-HUEHUETENANGO	Cuilco y Barillas	52	52	106	52	262
8/8/2016	MAGA	HUEHUETENANGO	50	0	0	150	200
8/10/2016	Cuilco-ADIMAM	Cuilco	50	75	0	0	125
8/15/2016	Municipalidad de San Miguel Ixtahuacan	San Miguel Ixtahuacan, Depto. San Marcos	335	0	0	0	335
8/15/2016	MSPAS	Nuevo Progreso, Depto. San Marcos	0	0	0	200	200
8/17/2016	Pastoral Social Caritas-San Marcos	Tajumulco, San Lorenzo y Sibinal	402	340	0	30	772
8/26/2016	Municipalidad de San Miguel Ixtahuacan	San Miguel Ixtahuacan, Depto. San Marcos	0	330	0	0	330
9/9/2016	MAGA	San Antonio H, Huehuetenango	0	0	0	100	100
9/30/2016	SOSEP, Huehuetenango	San Sebastian Huehuetenango, La Libertad, La Democracia, San Antonio Huista, Jacaltenango	250	0	0	250	500
TOTAL			1644	967	216	812	3639
SEED DELIVERED APRIL TO SEPTEMBER 2016 - SAN MARCOS DEPARTMENT-							
6/29/2016	Beneficiarios-MASFRIJOL	Sibinal, San Miguel Ixtahuacan	0	0	12	0	12
7/4/2016	Municipalidad de San Miguel Ixtahuacan	San Miguel Ixtahuacan, Depto. San Marcos	175	0	150	0	325
7/8/2016	Pastoral Social Caritas-San Marcos	Tajumulco, San Lorenzo y Sibinal	0	0	514	0	514
7/18/2016	Grupos de evaluacion nutricional	Varias comunidades	0	0	55	0	55
7/18/2016	Ruvelsi Sanchez, anacafe,	Aldea El Colmito Sn Miguel Ixtahuacan	45	0	0	0	45
7/18/2016	Parcelas Andolino Lopez Castañon	Caserio Sibinnal, SM. Ixtahuacan	38	0	0	0	38
7/25/2016	FUNCAFE	San Marcos, Varios	75	0	0	325	400
8/4/2016	FUNCAFE/San Miguel Ixtahuacan	San Miguel Ixtahuacan, Depto. San Marcos	67	0	0	0	67
8/10/2016	FUNCAFE	Varias comunidades San Marcos	8	81	50	0	139
8/15/2016	Grupos de evaluacion nutricional	Varias comunidades	0	0	0	80	80
TOTAL			408	81	781	405	1675
SEED DELIVERED APRIL TO SEPTEMBER 2016 - EL QUICHE DEPARTMENT -							
6/6/2016	MSPAS	Uspantan, Quiche	0	40	0	0	40
7/4/2016	Grupos de evaluacion nutricional	Varias comunidades	0	82	0	0	82
7/5/2016	Chel, The Ripple Effect, Inc.	Chajul, El Quiche	25	0	25	0	50
7/5/2016	Batzchocola, ECA, COCODE	Nebaj	0	70	0	0	70
7/12/2016	MSPAS	Sacapulas, Cunen,	0	65	75	0	140
7/19/2016	Grupos de evaluacion nutricional	Varias comunidades	0	30	0	0	30
7/19/2016	MSPAS	El Quiche	0	0	60	0	60
7/19/2016	MSPAS	El Quiche	0	0	20	50	70
7/25/2016	Grupos de evaluacion nutricional	varias comunidades	0	0	15	100	115
8/9/2016	MSPAS	Uspantan	0	30	0	0	30
8/9/2016	COCODE-PASANEP ALTO, Sacapulas	Pasanep Alto, Sacapulas	0	58	0	0	58
8/9/2016	COCODE-XICALVITZ, Nebaj	Xicalvitz, Nebaj	0	48	0	0	48
8/9/2016	La Laguna Batzchocola, COCODE.	La Laguna Batchocola.	0	13	0	0	13
8/9/2016	Visicuchun, Chajul, COCODE	Visicuchun, Chajul	0	12	0	0	12
9/9/2016	Municipalidad de Uspantan	Uspantan	0	200	0	0	200
9/9/2016	MSPAS	Uspantan	0	110	0	0	110
9/12/2016	MSPAS	USPANTAN	0	21	0	0	21
TOTAL			25	779	195	150	1149
SEED DELIVERED APRIL TO SEPTEMBER 2016 - TOTONICAPAN DEPARTMENT -							
6/30/2016	Municipalidad Santa Maria Chiquimula	Santa Maria Chiquimula, Totonicapan	0	75	75	0	150
7/4/2016	Gregorio Perez,	San Bartolo Aguas Calientes	0	0	8	0	8
7/4/2016	Grupos de evaluacion nutricional	Varias comunidades	0	45	0	0	45
7/4/2016	Almacenes de Semilla	San Bartolo Aguas Calientes	0	0	2	0	2
7/5/2016	Municipalidad San Bartolo Aguas Calientes,	San Bartolo Aguas Calientes Totonicapan	300	0	200	0	500
7/11/2016	CRS/SEGAMIL para ADIPO	Santa Lucia La Reforma, Santa Maria Chiquimula	105	0	70	0	175
7/11/2016	Municipalidad de San Miguel Ixtahuacan	Subchal, Maquivil, Chilive, Salitre, Alen,	0	100	0	150	250
7/12/2016	Rosa Cuyuch Sontay APEDER	Rachoquel, Momostenano, toto	0	0	45	0	45
7/26/2016	MASFRIJOL	Sicalbe, Momostenango	0	0	9	0	9
9/21/2016	Municipalidad San Bartolo Aguas Calientes,	San Bartolo Aguas C. Totonicapan	0	100	0	0	100
9/21/2016	MAGA-Momostenango	Momostenango, Totonicapan	50	50	0	0	100
9/22/2016	MAGA-Santa Lucia la Reforma	Santa Lucia la Reforma	75	75	0	0	150
TOTAL			530	445	409	150	1534
SEED DELIVERED APRIL TO SEPTEMBER 2016 - QUETZALTENANGO DEPARTMENT -							

Table No 2. Seed delivered Summary by Department during period April to September 2016. MASFRIJOL

SEED DISSEMINATION SUMMARY BY DEPARTMENT DURING THE PERIOD APRIL TO SEPTEMBER 2016					
DEPARTMENT	SEED DELIVERED APRIL-SEPTEMBER 2016 (inclusive)				
	ICTA S. Chiva	ICTA Altense	ICTA Hunapu	ICTA Ligero	Total
Huehuetenango Department	1,644	967	216	812	3,639
San Marcos Department	408	81	781	405	1,675
Quiche Department	25	779	195	150	1,149
Totonicapan Department	530	445	409	150	1,534
Quetzaltenango Department	11	0	0	0	11
<b>TOTAL</b>	<b>2,618</b>	<b>2,272</b>	<b>1,601</b>	<b>1,517</b>	<b>8,008</b>

#### 4. Community Seed Depots (CSD)

The MASFRIJOL team is proud to present positive results based on its experience with CSDs.. Promoting and supporting CSDs generates positive results in the improvement and sustainability of bean production in WHIP regions. The activities involved in the ACS (Almacen Comunitario de Semilla, i.e., Community Seed Depot) aim to produce and supply the communities with quality-declared bean seed demanded by producers that know the advantages of the MASFRIJOL-disseminated varieties. When produced locally, farmers can see the crop performance, learn about improved production practices, and buy seed at affordable prices. Table 4, below, shows the consolidated results from 36 CSDs that were established and harvested during the first season of the 2016 agriculture cycle.



Figure 2. Seed depot of Mr. Juan Agripino Alba. El Pino, Chiantla, Huehuetenango. 2016.

Of the 36 harvested CSDs, eight (22.2 percent) were established in the San Marcos, 14 (38.9 percent) in Huehuetenango, nine (25.0 percent) in Quiché, 1 (2.8 percent) in Quetzaltenango and 4 (11.1 percent) in Totonicapán. The total planting area was of 17801.2 m<sup>2</sup> (1.78 ha = 40.7 cuerdas of 437.0m<sup>2</sup>). It is noteworthy that not all of the CSDs succeeded in producing seed. Of the 36, one located in San Marcos (no. 4 in table 3, above), one in Huehuetenango (no. 9 in table 3, above), and one in Quiche (no. 25 in table 3, above) were disqualified for seed production because of severe pest damage or climate-related factors that prevented farmers from achieving a good crop. Apart from these three CSDs, the area of 16,291.2 m<sup>2</sup>, equivalent to 91 percent of the total area planted, was successful in producing seed.

Total production from the 33 harvested CSDs (without taking into account the three CSDs lost) represents an estimated average yield of 180.0lb/cuerda (one cuerda = 437 m<sup>2</sup>), equivalent to 4.1 MT/ha or 28.8 quintals per manzana (one manzana = 7,000 m<sup>2</sup>). Total seed production is calculated by subtracting the rejected beans (broken, shapeless, pale, etc.) after the harvest is conditioned or cleaned. The total cleaned seed amounts to 4094.2lb while the total rejected

harvest used for home consumption is 2640.1lb. This is equal to a conditioned seed yield of 60.8 percent for the 33 CSDs. Some CSDs had very low rejection thanks to better threshing practices, an area where more training will be provided.

**Table 3. Information of Seed Depots that already Harvested (Primera Planting Season2016)**

No	Farmer Name	Department	Municipality	Community	Altitude masl	Area (m <sup>2</sup> ) ++	Improved Variety Planted*	Total yield (pounds by 437m <sup>2</sup> = 1 Cda.++)	Seed yield (pounds by 437m <sup>2</sup> = 1 Cda.++)	Grain yield (pounds by 437m <sup>2</sup> = 1 Cda.++)	Seed Price (US \$)+ got per pound
1	Francisco Aquilino Perez Mendez**	San Marcos	S. M. Ixtahuacan	El Salitre	1,760		Altense	56.2	0.0	56.2	-
							Ligero	79.9	0.0	79.9	-
2	Miguel Estanislao Cinto Bamaca	San Marcos	S. M. Ixtahuacan	EXIAL	2,287		S. Chiva	218.5	120.2	98.3	1.00
							Altense	231.6	137.7	94.0	1.00
3	Carlos Camerlino Dominguez Gonzales	San Marcos	S. M. Ixtahuacan	Tierra Blanca	1,520		Ligero	218.5	174.8	43.7	1.00
							Altense	174.8	120.2	54.6	1.00
4	Jose Bamaca Sales**	San Marcos	S. M. Ixtahuacan	Siete Platos	1,624	220.0	Hunapu	Totally lost because critic pest damages			
5	Ricardo Benito Gonzalez	San Marcos	S. M. Ixtahuacan	Chisnan	2,087	220.0	Altense	298.0	198.6	99.3	1.13
6	Hector Modesto Bravo Lopez	San Marcos	S. M. Ixtahuacan	Maquivil	2,194	340.0	Altense	251.9	132.4	119.5	1.25
7	Edgardo Anastacio Diaz Domingo	San Marcos	S. M. Ixtahuacan	Las Escobas	2,473		Hunapu	262.2	218.5	43.7	1.25
							Altense	234.9	163.9	71.0	1.25
8	Leoncio Gumerindo Gonzalez Ajpop	San Marcos	S. M. Ixtahuacan	Alen	2,076	350.0	Hunapu	117.4	62.4	54.9	0.88
9	Elpidio Lopez Figueroa/Jose L. Figueroa	Huehuetenango	Chiantla	Al. El Carpintero	1,916	416.0	Hunapu	15.8	Considered lost because pest damages		
10	Jesus Ramirez	Huehuetenango	Concep. Huista	Yichoch	2,002	482.4	Hunapu	138.6	102.4	36.2	0.63
11	Bartolo Hernandez Diaz	Huehuetenango	Concep. Huista	Petatan	1,158	504.5	Hunapu	86.6	0.0	86.6	-
12	Juan Agripino Alba Cifuentes	Huehuetenango	Chiantla	El Pino	2,558	819.3	Hunapu	320.0	213.4	106.7	?
13	Eulalio Veasquez Cano	Huehuetenango	Concep. Huista	Trapichitos	1,142	342.6	Hunapu	229.6	191.3	38.3	0.75
14	Carlos Enrique Rodriguez Lucas	Huehuetenango	San Ant. Huista	Can. Reforma	1,095	303.4	Hunapu	252.1	165.6	86.4	0.75
15	Francisco Sanchez Miguel	Huehuetenango	Jacaltenango	Pelbipam	751	356.0	Ligero	184.1	110.5	73.7	0.75
16	Artemio Ortiz Martinez	Huehuetenango	Todos S. Cuchumat.	San Martin	2,028	745.3	Hunapu	164.2	105.5	58.6	0.80
17	Ernesto Martin Pablo	Huehuetenango	Jacaltenango	Chapaltelaj	1,495	294.3	Hunapu	259.9	222.7	37.1	0.75
18	Alberto Carmelino Hernandez Quiñonez	Huehuetenango	Jacaltenango	Hunta	750	398.0	Ligero	109.8	76.9	32.9	0.75
19	Gildardo Fredy Herrera Jimenez	Huehuetenango	San Ant. Huista	Las Galeras	1,016	432.1	Hunapu	207.3	119.3	88.0	0.88
20	Pedro Lopez Martinez	Huehuetenango	San Ant. Huista	Nojoyá	995	612.9	Hunapu	189.0	142.6	46.3	0.75
21	Angel Otoniel Castillo Castillo	Huehuetenango	Jacaltenango	Pelbipam	744	711.0	Ligero	94.7	49.2	45.5	0.75
22	Benito Ramos Matias	Huehuetenango	Concep. Huista	Yulá	1,745	475.4	Hunapu	170.0	137.9	32.2	0.75
23	Gaspar Garcia Ulan	El Quiche	Sacapulas	Chutinimit	1,442	437.0	Hunapu	74.0	53.0	21.0	0.63
24	Victor Yat Jimon	El Quiche	Zacualpa	Chixocol	1,578	315.0	Hunapu	106.8	55.5	51.3	0.75
25	Santiago Lux Garcia**	El Quiche	Zacualpa	La Vega	1,469	874.0	Hunapu	Totally lost because farmer personal problems			
26	Manuel Hernandez Garcia	El Quiche	Zacualpa	Tunajá I	1,618	437.0	Hunapu	136.0	16.0	120.0	0.63
27	Francisco Tun Riquiac	El Quiche	Zacualpa	S. Ant. V Centro	1,793	874.0	Hunapu	221.5	52.5	169.0	0.63
28	Felino Morales Lopez	El Quiche	S. Miguel Uspantan	Chotom	1,631	437.0	Hunapu	183.0	146.0	37.0	0.63
29	Froilan Noriega Ramirez	El Quiche	S. Miguel Uspantan	Xolalbarda	1,405	874.0	Hunapu	200.0	50.0	150.0	0.63
30	Juan Lopez Chivalan	El Quiche	Sta. Maria Cunen	Los Planes	1,774	437.0	Hunapu	145.0	70.0	75.0	0.63
31	Victor Ines Samayoa Velasquez	El Quiche	Sta. Maria Cunen	Rio Blanco	1,580	437.0	Altense	112.0	80.0	32.0	0.73
32	Elena L. Velasquez/Juana B. Velasquez**	Huehuetenango	Quetzaltenango	S. J. Ostuncalco	2,041	545.0	Altense	160.4	0.0	160.4	-
33	Modesta Barrera Ajcá	Totonicapan	Momostenango	S. Jose Sigulla (S	1,906	530.0	Hunapu	189.6	131.9	57.7	1.00
34	Santos T. Garcia Vargas/Rony Garcia	Totonicapan	Momostenango	Xequemeya (Pat	1,790	241.0	Hunapu	344.5	253.9	90.7	0.63
35	Obispo Barrera	Totonicapan	Momostenango	San Jose Sigulla	1,868	500.0	S. Chiva	166.1	122.4	43.7	1.00
36	Miguel Tojin	Totonicapan	Sta. L. La Reforma	San Luis Sibila	1,686	540.0	Hunapu	145.7	97.1	48.6	1.00
<b>TOTAL</b>						17,801.2 1.78 ha		6,734.2 3.1 Ton	4,094.2 1.9 Ton	2,640.1 1.2 Ton	

TABLE NOTES: \* Improved varieties: ICTA Hunapu, ICTA Super Chiva, ICTA Altense e ICTA Ligero. / \*\* Seed Depot declared lost mainly for maintenance reasons.  
+ Currency exchange 08.0 = US\$1.0. / ++ 437 m<sup>2</sup> = 1 Cuerda = 0.044 Ha = 0.062 Maz.

It is important to note that at the time of writing this report, more than 77.8 percent of total seed produced in CSDs was sold as seed by CSD owners directly to other farmers identified in the community. In some cases, the seed was sold to individuals and organizations that were not fully identified, but research on where the seed went is ongoing.. Depending on the destination, sales were made in small amounts (1-5 pounds) or, in some cases, larger bulk quantities. In a few instances, farmers sold their entire seed yield in a single sale to seed retailers. MASFRIJOL cannot impose a set way to market seed, since we are not constantly with farmers. It is encouraging, however, that farmers themselves have built trade relationships within and outside the community.

In terms of impact for area planted with CSD-produced seed, assuming that 5.0 lbs. are required to plant a cuerda of land (437 m<sup>2</sup>), the total harvested seed produced by CSDs would already be sufficient to plant approximately 818.8 cuerdas (35.8 ha = 51.2 manzanas), which is a considerable amount of land for the type of land tenure in the highlands of Guatemala. This

planting also brings an increase in grain production for family consumption, thus contributing to improved nutrition for these families.

Bean yields and seed prices motivate CSD owners to continue working in seed production. Table 4 shows average yield data obtained for CSDs. The highest yield (including preconditioned seed) average was obtained in Totonicapán, at 211.5 lbs./cuerda; the lowest was obtained in Quiché, with 147.3 lbs./cuerda, which is still very good. A similar yield performance was observed for grain production. Information available at the time of this report indicates that, on average, seed was sold at US \$0.85/lb, with the average lowest price US \$0.66/lb obtained in Quiché and the highest price of US \$1.08 fetched in San Marcos. It should be noted that we still need to finish selling seed in some CSDs. Based on the average selling price of seed that has been sold to date (US \$0.85/lb), the monetary value of all the seed produced by CSDs amounts to US \$3480.1 (approx. Q27,840.6 quetzales). It is important to note that CSDs sell the seed at twice the price of grain—an important motivational factor in their interest in maintaining production of high quality-declared seed.

**Table 4. Average data of Seed Depots–MASFRIJOL, by Department**

Department	Area (m2) ++	Total yield (pounds by 437m <sup>2</sup> = 1 Cda.++)	Seed yield (pounds by 437m <sup>2</sup> = 1 Cda.++)	Grain yield (pounds by 437m <sup>2</sup> = 1 Cda.++)	Seed Price (US \$)+ got per pound
San Marcos	285.8	194.9	147.6	74.1	1.08
Huehuetenango	492.4	185.1	136.4	59.1	0.76
Quiche	569.1	147.3	72.4	81.9	0.66
Quetzaltenango	545.0	160.4	-	160.4	-
Totonicapán	452.8	211.5	151.3	60.2	0.91
	469.0	179.8	126.9	87.1	0.8512

Table Notes: + Currency exchange Q8.0 = US\$1.0.;  
++ 437 m2 = 1 Cuerda = 0.044 ha = 0.06mz.

While these 33 CSDs are a success story, we have also learned much from the three CSDs that did not harvest seed. It is very encouraging to report that 19 new CSDs are in the process of planting for the second 2016season. Table 5 shows where these CSDs are located. MASFRIJOL is convinced that CSDs will be a sustainable contribution to the improvement of the bean seed system in remote communities, providing farmers with access to buying high quality seed close to their homes.



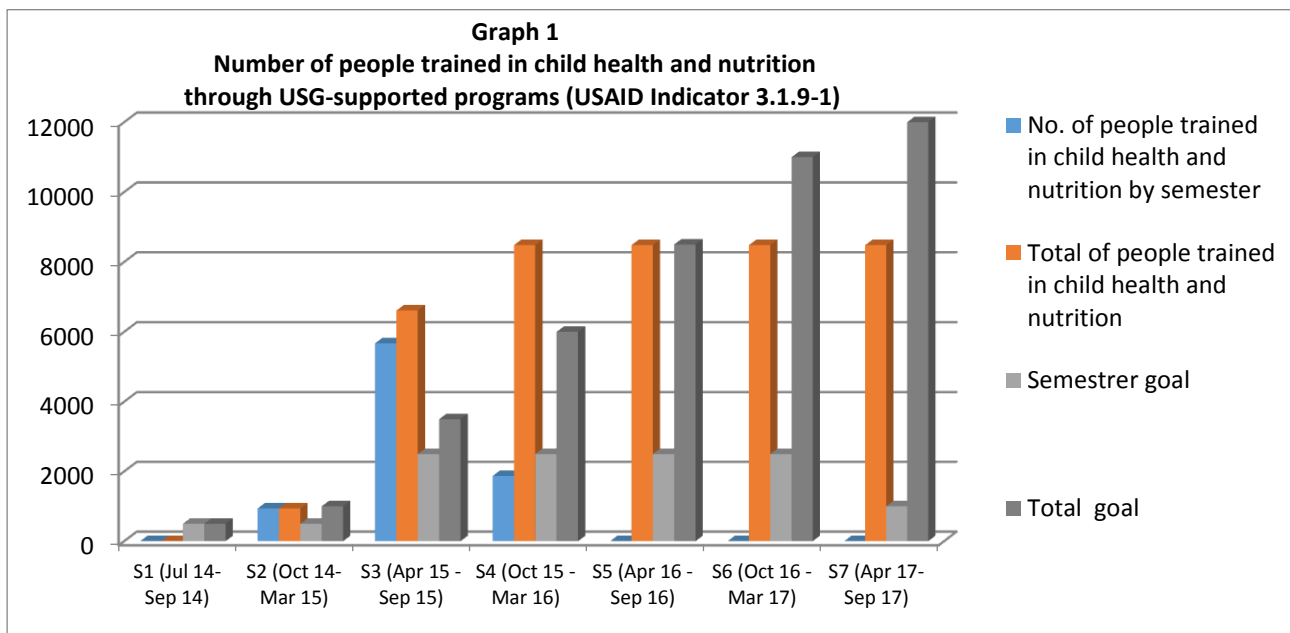
**Table 5. Information of Seed Depots even Unharvested or Expected Planting-MASFRIJOL Project (Second Cycle Year 2016)\***

No	Farmer Name	Department	Municipality	Community	Altitude masl	Area (m <sup>2</sup> ) ++	Improved Variety Planted**	Planting Date (or expected)	Observations
1	Manuel Calel Castro	Totonicapan	Sta. M. Chiquimula	Xalcata	1,883	400.0	S. Chiva	30-05-2016	Expected harvest during October 2016
2	Marcos Lux Tiu	Totonicapan	Sta. M. Chiquimula	Chichic	2,057	560.0	S. Chiva	04-08-2016	Expected harvest at end of Nov. 2016
3	Sara Castro Chic/Isabel Chacaj	Totonicapan	Sta. M. Chiquimula	Xebe	2,324	237.0	Altense	24-05-2016	Expected harvest during October 2016
4	Antonio Tzoy	Totonicapan	Sta. L. La Reforma	S. Luis Sibila	1,587	498.0	Altense	27-07-2016	Expected harvest at end of Nov. 2016
5	Laura Milagrosa Pu	Totonicapan	Sta. L. La Reforma	Ctro. S. L. Sibila	1,730	324.0	Altense	01-08-2016	
6	Leonzo Lux	Totonicapan	Sta. L. La Reforma	Ctro. S. L. Sibila	1,742	708.0	Altense	01-08-2016	
7	Gregorio Peres	Totonicapan	S. Bart. A. Calientes	Centro S.B.A.C.	2,041	400.0	Hunapu	01-08-2016	
8	Felipa Isabel Herrera Lopez de Orozco	Quetzaltgo.	S. J. Ostuncalco	Las Barrancas		874.0	Hunapu	18-10-2016	
9	Lucia Leticia Crisostomo Matias	San Marcos	Comitancillo	Taltimiche	2,310	441.0	Hunapu	17-05-2016	Expected harvest during October 2016
10	Baudilio Santos Lopez Perez	San Marcos	Tajumulco	El Malacate	1,818	882.0	S. Chiva	19-09-2016	
11	Hilda Chilel Lopez	San Marcos	Tajumulco	Monte Perla	2,430	441.0	S. Chiva	21-09-2016	
12	Hermeregildo Margarito Lopez Martin	San Marcos	Tajumulco	Monte Perla	2,232	441.0	S. Chiva	20-09-2016	
13	Carlos Cruz de La Cruz	Quiche	Zacualpa	Chichaj		874.0	Hunapu/Altense	10/10/2016	
14	Salomé Tavico Noriega	Quiche	San M. Uspantán	Chocox		874.0	Hunapu/Altense	15/10/2016	
15	Francisco Tiú	Quiche	Sacapulas	Chacagüex		437.0	Hunapu	02/11/2016	
16	Nicolás Pú Tojin	Quiche	Sacapulas	Cuesta del Águila		437.0	Hunapu	25/11/2016	
17	Santiago Mejia Tojin	Quiche	Sacapulas	Rancho de Tejas		874.0	Hunapu/Altense	02/12/2016	
18	José María Reyes	Quiche	San M. Uspantán	Palquí		437.0	Altense	02/12/2016	
19	Lucas Hernández Dubón	Quiche	Sta. María Cúmén	San Luis		874.0	Hunapu/Altense	02/12/2016	
<b>TOTAL</b>						11,013.0			
						1.10 ha			

TABLE NOTES: \* Some other Seed Depots would be still expected to be planted during 2016. / \*\* Improved varieties: ICTA Hunapu, ICTA Super Chiva, ICTA Altense e ICTA Ligero. / ++ 437 m<sup>2</sup> = 1 Cuerda = 0.044 Ha = 0.062 Maz.; / ++ 437 m<sup>2</sup> = 1 Cuerda = 0.044 Ha = 0.062 Maz.

## 5. Enhancing the Nutritional Quality of Diets

Over the past six months, MASFRIJOL has presented numerous nutrition education sessions in the five WHIP departments, sometimes in partnership with MSPAS and MAGA. As of October 1, 2016, the MASFRIJOL team had trained 3,483 beneficiaries through at least one training session. Most of the participants (82.2 percent) were women and 17.78 percent were men. This total indicates that the project has achieved 100 percent of its goal to benefit 12,000 households with nutrition education during its tenure (Graph 1).



There are seven MASFRIJOL nutritional education lessons that focus on the following critical matters:

1. Raising awareness about the consequences of chronic malnutrition;
2. The importance of high quality protein to reduce stunting;
3. Complementary feeding from 6-11 months and then 11-24 months and
4. Frequency of feeding, consistency of porridge and adding beans to porridge;
5. How to eat a balanced diet that includes beans during pregnancy and lactation;
6. Nutritious, delicious, and economical recipes using beans; and
7. Eating more vegetables and fruits.

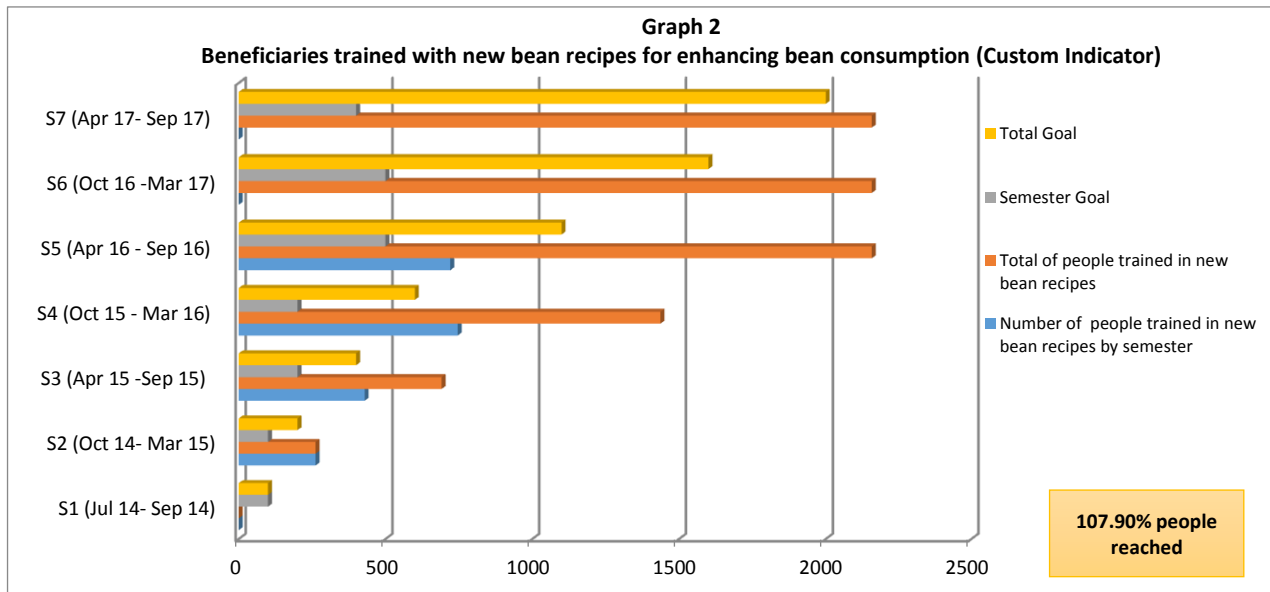
It is important to note that each lesson emphasizes the importance of daily bean consumption for good health. These nutritional lessons were delivered using dynamic activities and motivational videos designed especially for the WHIP population's native culture and resources. Simple, one item, visual pre- and posttests were used with the first five lessons to evaluate change in knowledge about beans and health.

One of the best received MASFRIJOL nutrition-education strategies was the preparation of bean-based recipes. Both women and men learned easy methods for diversifying the way they prepared beans to feed their families, with every recipe following the principle of mixing beans with cereals, such as corn, to create a high quality protein. This hands-on activity triggered engaged discussions among the beneficiaries, in which they created or modified recipes according to their preferences and ideas.

The bean based recipes that have been taught so far are:

- Torta de frijol y hojas verdes
- Ensalada de frijol y maíz
- Ceviche de frijol y protemás
- Caldo de frijol y camote
- Papilla de frijol y papa
- Mixtas de frijol

Over the past six months, the MASFRIJOL team trained 721 beneficiaries who participated in at least one recipe demonstration session. Graph 2 illustrates the progress achieved through a timeline of nutrition education using the recipes listed above. The total, illustrated with the gold-colored line indicates that the project has achieved the 108 percent of its goal to benefit 2,000 households. The MASFRIJOL team will continue with this activity, however, because of its



good acceptance in the rural communities.

### Nutritional Evaluation

According to the PMP, MASFRIJOL will evaluate changes in bean consumption at the household level and in the nutritional status of women and children younger than five years for 700 families. This strategy involves three different steps.

1. **Pre-Nutritional Evaluation**, wherein the data gathered from families includes anthropometric data for children under five years, weekly bean consumption in the household, and dietary diversity scores for women, pregnant women and children under two years old.
2. **Intensive Educational Sessions** with these 700 families, all of whom receive nutritional lessons and seven lessons on bean agronomy.
3. **Post-Nutritional Evaluation**, wherein the same data is collected as in the pre-nutritional evaluation.

Selection of the communities for this nutritional evaluation was made randomly from a list of beneficiary communities reported by the MASFRIJOL team and its partners across the 30 municipalities in the five departments in WHIP. Participation in the evaluation was voluntary. By October 2016, MASFRIJOL had finished the pre-nutritional evaluation, having reached 817

families among the communities listed in Table 6. MASFRIJOL has already begun the second step, Intensive Education, and the progress of this intervention to date is also shown in Table 1.

Table 6. MASFRIJOL Nutrition Evaluation Coverage

Department	Municipality	Community	No. Families	% Progress Nut/Ag Education
<b>San Marcos</b>	Concepción Tutuapa	La Laguna	10	40
		La Unión	7	40
		Santo Domingo	7	40
		Sochel	3	40
		Tuichuná	10	40
	San Miguel Ixtahuacan	Cabajchum	7	100
		Chilive	7	40
		Chininhuitz	6	100
		Chisnan	6	100
		Exial	7	100
		La Estancia	8	40
		La Peña	13	40
		Las Escobas	10	100
		Legual	13	40
		Maquivil	7	100
		El Salitre	6	100
		Shanshegual	9	20
	San Pablo	El Tocache	12	20
		El Trapiche	14	60
		La Joyita	26	60
		Santo Domingo II	14	60
	Nuevo Progreso	Pueblo Viejo	13	20
		La Conquista	14	20
		Nuevo Porvenir	10	0
		Emanuel	10	0
		Ixcahuin	12	20
		La Suiza	11	20
		San Ignancio	7	20
	San Rafael Pie de la Cuesta	El Naranjo	9	60
		Las Palmas	14	20
Nueva Libertad		11	60	
Nuevo San Rafael		10	60	
<b>TOTAL</b>			<b>323</b>	

<b>Huehuetenango</b>	Concepción Huista	Ajul	6	100	
		Cabic	4	100	
		Cantón Unión, Mendez, Pozo	7	100	
		Petatán	5	100	
		Secheu	8	100	
		Trapichitos	10	100	
		Tzuná	9	100	
		Tzunhutiz	6	100	
		Yichoch	6	100	
		Yulá	5	100	
	Barillas	Recreo C	14	0	
		El Quetzal	11	0	
	Las Libertad	Santo Domingo	9	100	
	Chiantla	Chichalum	9	0	
	San Antonio Huista	Las Galeras	7	80	
		Nojoyá	7	80	
	Todos Santos Cuchumatán	Villa Alicia	11	40	
		San Martín Cuchumatán	9	40	
		Chicoy	8	40	
		Las Lajas	10	40	
	San Sebastian Huehuetenango	Mapá	9	80	
		Palajachuj	10	80	
		Sipal	11	80	
		Sujal	8	80	
		Tojchec	7	60	
	<b>TOTAL</b>			<b>206</b>	
	<b>Quetzaltenango</b>	San Juan Ostuncalco	Lagunas Cuaches	6	100
Las Victorias			2	0	
Los Alonzos			10	100	
Monrovia			5	20	
Concepción Chiquirichapa		Barrio San Marcos	2	0	
		Duraznales	5	80	
		Excomuchá	1	0	
		Telená	6	100	
		Tuipox	6	80	
<b>TOTAL</b>			<b>43</b>		
<b>Quiché</b>	Chajul	Ixlaj	5	100	
	Cotzal	Pamaxán	3	100	
	Cunen	Bellas Flores	7	100	
		Chiul	4	100	

		El Paraiso	5	100
		El Pericón	8	100
		Pozo Verde	11	100
		San Luis	5	100
		Sausucuché	6	100
		Xetzac	9	100
	Nebaj	Batzchocolá	6	100
	Sacapulas	Chacagux	9	80
		Chibuc	8	40
		Chimux	6	40
		Chuitinimit	10	100
		Cuesta del Aguila	5	80
		Guantajau	3	40
		Pasanep Alto	10	40
	Zacualpa	Rancho de Teja	10	80
		La Vega	7	20
		Tierra Blanca	4	20
	Uspantán	Potrero Viejo II	9	20
		Chitapol	5	100
		Chocox	6	80
		Cholá	8	100
<b>TOTAL</b>			<b>169</b>	
<b>Totonicapán</b>	Momostenango	Racaná	11	40
		Rachoquel	10	100
		San Vicente Buenabaj	9	100
		Tierra Colorada	9	100
	Santa Lucía la Reforma	Paquit	8	100
		Pabur	12	60
		Pamaría	8	60
		San Luis Sibilá	9	100
<b>TOTAL</b>			<b>76</b>	

The pool of 817 families contained 891 children. Of these, 23 percent of children were less than 1 year of age, 27.8 percent were 1<2 years old, and finally 49.2 percent were from 2<5 years old. These children were measured for height and weight and the data were analyzed using the WHO ANTHRO software. Findings from the pre-nutritional evaluation showed that 60.4 percent of children evaluated had chronic malnutrition. Of these, approximately 35.6 percent showed moderate delay (<2 Z score Ht/age) in growth while 24.8 percent had a severe delay in growth (<3 Z score Ht/age). Table 7 shows the details for the USAID indicator (“Indicator 3.1.9-11

Prevalence of stunted children under five years of age”) reported for each of the MASFRIJOL target departments.

Table No. 7 Height for Age Standard deviation in measured children by Department in the Pre-Nutritional Evaluation Indicator USAID 3.1.9-11 “Prevalence of Stunted children under five years of age”					
Department	Total Children measured	Normal Height	Chronic Malnutrition		
		# Children % HAZ Normal	# Children % HAZ <-2 Moderate Stunting	#Children % HAZ < -3 Severe Stunting	# Children % Total Chronic Malnutrition
Quetzaltenango	51	15 29.42%	21 41.17%	15 29.41%	36 70.58%
Totonicapán	83	29 34.94%	22 26.50%	32 38.55%	54 65.06%
San Marcos	332	157 47.29%	127 38.25%	48 14.45%	175 52.71%
Huehuetenango	227	99 43.61%	70 30.84%	58 25.55%	128 56.39%
Quiché	198	53 26.77%	77 38.88%	68 34.34%	145 73.23%

HAZ= Height for Age Z score

Anthropometric data were also analyzed for the USAID Indicator “3.1.9-12 Prevalence of wasted children under five years of age,” where it was found that 4.4 percent of children had acute malnutrition (low Wt/Ht). Of these, 2.9 percent had moderate-acute malnutrition (<2 Z scores Wt/Ht) and 1.5 percent had severe-acute malnutrition (<3 Z scores Wt/Ht). Because severe malnutrition can be life threatening, MASFRIJOL coordinated with the Health Minister technicians (MSPAS) so that MSPAS could provide treatment.

It is important to mention that 1.7 percent of children were overweight and 0.3 percent obese according to their weight for age. Despite this small portion of overweight and obesity, nutritional strategies should begin to address this problem in the Western Highlands of Guatemala.

**Table 8** shows the data for the USAID Indicator 3.1.9-12 Weight for Height Z scores in each of the five departments.

Table No. 8 Weight for Height standard deviation in measured Children by Department in the Pre-Nutritional Evaluation											
Department	# Children measured	Normal Weight	Acute Malnutrition				Overweight and Obesity				
		# Children % WHZ Normal	# Children % WHZ <-2 Moderate	#Children % WHZ < -3 Severe	# Children % Total Acute Malnutrition	# Children % WHZ >+2 Overweighed	#Children % WHZ >+3 Obesity	#Children % Total Overweight and Obesity			
Quetzaltenango	51	50 98.04%	0 0%	0 0%	0 0%	1 1.96%	0 0%	1 1.96%			
Totonicapán	83	76 91.56%	4 4.76%	3 3.57%	7 8.33%	0 0%	0 0%	0 0%			

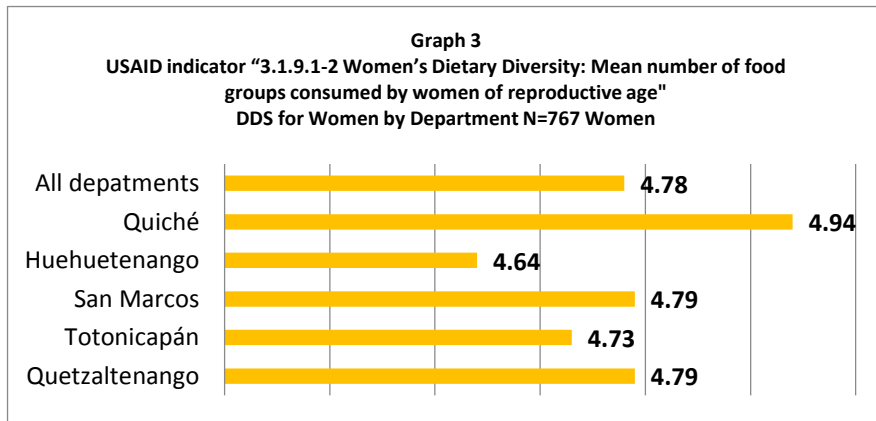
San Marcos	332	310 93.37%	10 3.01%	6 1.81%	16 4.82%	6 1.81%	0 0%	6 1.81%
Huehuetenango	227	212 93.39%	7 3.08%	3 1.32%	10 4.41%	2 0.88%	3 1.32%	5 2.20%
Quiché	198	186 93.94%	5 2.52%	1 0.51%	6 3.03%	6 3.03%	0 0%	6 3.03%

**WHZ= Weight for Height Z score**

MASFRIJOL will be assessing possible changes in bean consumption at the household level with the families from this sample. The MASFRIJOL team has recovered 649 bean consumption forms from the 817 needed. We are now analyzing the bean consumption data and the findings will be presented in the next report.

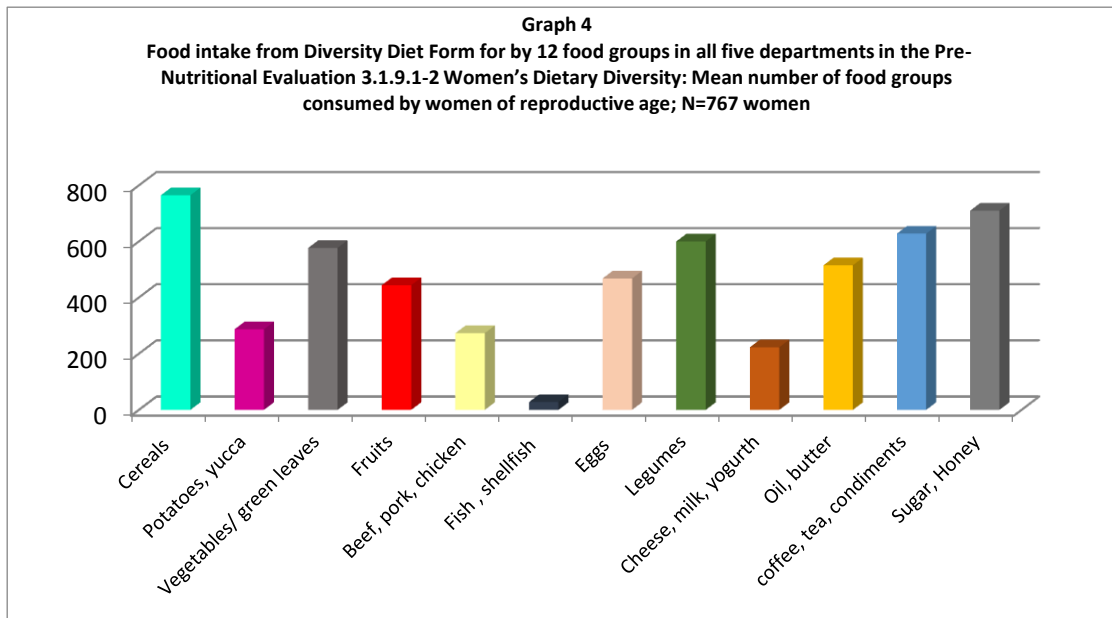
**Dietary Diversity of Women and Children**

**Women.** MASFRIJOL evaluated dietary diversity in the nutritional evaluation for the USAID indicator “3.1.9.1-2 Women’s Dietary Diversity: Mean number of food groups consumed by women of reproductive age.” Graph 3 shows the mean number of food groups by the five WHIP departments using the FANTA III scale for the first nine different groups of food. The women in all five target departments averaged 4.7+1.5 food groups consumed.





Graph 4 displays the frequency of intake by food group in the pre-nutritional evaluation. The three most consumed food groups were: cereals; sugar or honey; and coffee, tea, or condiments. Most women (n=600) reported consuming some kind of beans—white, red, or black. The three least consumed groups were dairy, fish or shellfish, and poultry. MASFRIJOL also queried the women about consumption of junk food or food low in nutrients. Some women (n=191) consequently reported regularly consuming foods like Tortrix, Ramen noodles, etc.



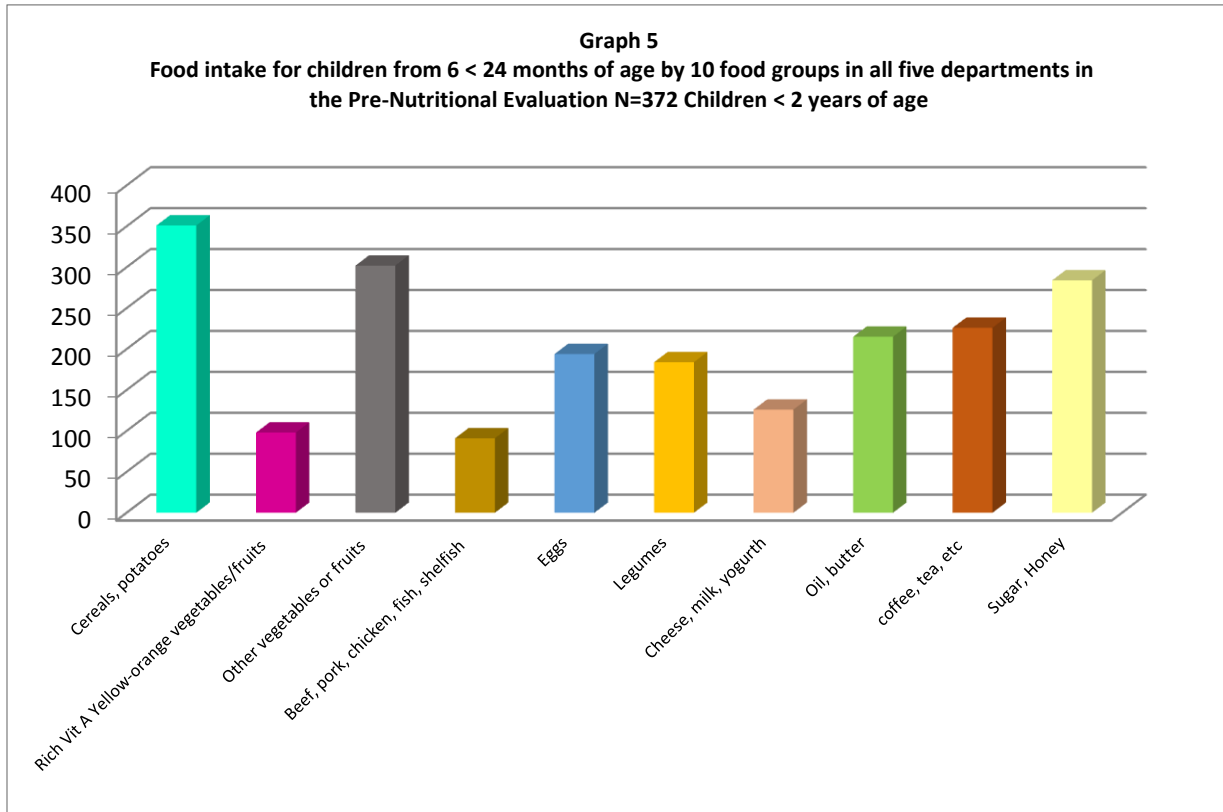
**Children.** MASFRIJOL evaluated the diversity diet score of children from 6 to less than 24 months of age using the FANTA III scale based on eight food groups;<sup>1</sup> however, to calculate minimum dietary diversity, MASFRIJOL used the WHO guidelines of four or more of the first seven food groups.<sup>2</sup> **Graph 5** displays the frequency a food group was consumed the day before the evaluation. Like their mothers, children most frequently consumed cereals, especially corn. Other vegetables and fruits were the second most consumed food group. For children under two years, it is most important to consume fruits and vegetables rich in Vitamin A, but only 98 children consumed food from this group. Only 52 percent of the children achieved minimum dietary diversity. Three babies were only breastfed and ate no solid foods.

Several mothers reported that their children consumed beans the day before; upon further probing, however, the MASFRIJOL team found that mothers were feeding children only the broth from beans. Because the broth has mostly carbohydrates and ash with very little protein, we did not count the water in which beans were cooked as legumes. Consequently less than the 50 percent of children consume the whole beans.

<sup>1</sup> Swindale A, Bilinsky P. Puntaje de diversidad dietética en hogar Versión 2, WDC: FANTAI, 2006.

<sup>2</sup> Arimond M, Deitchler M. Indicators for assessing infant and young child practices, part 2. Malta: WHO, 2010.

MASFRIJOL asked mothers about their reasons for not feeding beans to children less than two years. Mothers reported fear of flatulence and stomach irritation in their babies. They also did not know how nutritious beans were for their babies. For this reason, the MASFRIJOL lessons on complementary feeding include a demonstration of thick porridge made from corn and beans. These findings highlight the importance of continued parental education on the high quality, affordable protein available from beans as well as on ways to prepare beans to decrease flatulence.



## 6. Success Stories (featuring Huehuetenango)

### MASFRIJOL Beans at a Convenience Store

Mrs. Marina Victoria Geronimo Calmo is a resident of Villa Alicia, Todos Santos Cuchumatán, and a community leader. To supplement her income, she owns a small convenience store that carries all kinds of grocery products, most of which are highly processed foods. Marina has also been involved in MASFRIJOL in her village since the beginning



of the project, and two years ago she received ICTA Super Chiva bean seed. Since then, she has been successfully planting and harvesting this variety. The first time she tried it, she was impressed with the high yields and loved the taste.

Because of her continued success in growing and harvesting more than enough beans for family consumption, she decided to channel her bean surplus into her store, thus adding a nutrient-packed product to her offerings. Now, other community residents don't have to go so far to buy this important staple. As an innovator and entrepreneur adopting this high-yielding bean variety, Mrs. Geronimo is making it possible for beans to be available and accessible to everyone else in Villa Alicia.

Her example, growing, eating, and selling beans, increases the likelihood that other residents will follow her example. As a respected leader, there's no doubt that Marina is not just reaping the benefits of her involvement in this project for herself but leveraging her MASFRIJOL knowledge and resources for the benefit of others in her community.

### **New Attitudes**

In 2016, MASFRIJOL selected Najoya and Las Galeras, two communities in San Antonio Huista as part of a group of communities participating in targeted nutrition education sessions. During the first sessions, it was not unusual to observe arriving participants and children consuming calorie-dense snacks and highly processed foods. Consumption of such food was normal among these groups. However, by the third nutrition education session, children would arrive eating some kind of fruit or incaparina.



During the last nutrition education session—and the time for bean seed distribution, a new mother, who had not participated in the nutrition education sessions, arrived with her child, who was holding a bag of chips. Seeing what the child was eating, women in the group who had attended the nutrition education sessions quickly approached and advised the incoming mother eating chips was not healthy for her child, suggesting fruits and

beans as alternatives to the processed food.

These examples illustrate how education and peer pressure can influence changes in attitudes and related eating practices.

**7. PMP Indicators, Cumulative to FY 2016**

Pending and will attach to final version when revised.