



Estimated Average Requirements Provided by Biofortification

HarvestPlus sets micronutrient target levels for biofortified crops by accounting for the physiological requirement of the micronutrient, the per capita consumption of each crop, nutrient losses (during storage, processing, or cooking), and the fractional absorption of the total micronutrient content. This data is used to estimate the percent of the estimated average requirement (EAR) for women and children provided by the total micronutrient content in biofortified crops.

Summary: Target Crop Levels and Estimates of Contribution to EAR

Crop	Target Increment Provided by Biofortification	Estimated Proportion of the Estimated Average Requirement Provided for Non-Pregnant, Non-Lactating Women*		Estimated Proportion of the Estimated Average Requirement Provided for Children, 1- 6 years old*	
		Before Biofortification	After Biofortification	Before Biofortification	After Biofortification
Beans	+44 ppm iron	50%	90%	40%	75%
Pearl Millet	+30 ppm iron	50%	85%	45%	75%
Sweet Potato	+70 ppm provitamin A	0%	≥100%	0%	≥100%
Cassava	+15 ppm provitamin A	0%	≥100%	0%	95%
Maize	+15 ppm provitamin A	0%	55%	0%	60%
	+12 ppm zinc	45%	70%	55%	80%
Rice	+12 ppm zinc	40%	70%	40%	70%
Wheat	+12 ppm zinc	50%	75%	25%	35%

*Rounded to the nearest 5%

Non-Pregnant, Non-Lactating Women: Target Levels and Estimates of Contribution to EAR, with Assumptions

	Iron Beans	Iron Pearl Millet	Provitamin A Sweet Potato	Provitamin A Cassava	Provitamin A Maize	Zinc Maize	Zinc Rice	Zinc Wheat
Per Capita Consumption (g/day) ^a	200	220	400	500	290	290	400	300
Baseline Micronutrient Content (mg/kg)	50	47	0	0	0	25	16	25
Micronutrient Retention After Processing, Storage, Cooking ^b	90%	90%	35%	35%	37%	90%	90%	95%
Intake of Nutrient Adjusting for Retention (mg/day)	9.0	9.3	0.0	0.0	0.0	6.5	5.8	7.1
Bioavailability	7%	8%	8%	20%	17%	20%	20%	20%
Amount of Nutrient Absorbed * (mg/day)	0.6	0.7	0.0	0.0	0.0	1.3	1.2	1.4
Physiological Requirement (mg/day)	1.34	1.34	0.5	0.5	0.5	2.9	2.9	2.9
Percent of Estimated Average Requirement (EAR)	47%	52%	0%	0%	0%	45%	40%	49%
Micronutrient Content After Biofortification (mg/kg)	94	77	70	15	15	37	28	37
Micronutrient Retention After Processing, Storage, Cooking	90%	90%	35%	35%	37%	90%	90%	95%
Intake of Nutrient Adjusting for Retention (mg/day)	16.9	15.2	9.8	2.6	1.6	9.7	10.1	10.5
Bioavailability	7%	8%	8%	20%	17%	20%	20%	20%
Amount of Nutrient Absorbed (mg/day)	1.18	1.14	0.81	0.53	0.27	1.93	2.02	2.1
Physiological Requirement (mg/day)	1.34	1.34	0.50	0.50	0.50	2.9	2.9	2.9
Percent of Estimated Average Requirement (EAR)	88%	85%	163%	105%	54%	67%	70%	73%

^a Per capita consumption of staples (g/day) estimates based on FAOSTAT

^b Retention figure accounts for losses due to parboiling and cooking (100-85% retention after milling in non-parboiled rice; 60% retention after milling in parboiled rice; 90% retention from cooking)

*Absorption accounts for intake adjusted for retention and bioavailability

Children, 1 – 6 years old: Target Levels and Estimates of Contribution to EAR, with Assumptions

	Iron Beans	Iron Pearl Millet	Provitamin A Sweet Potato	Provitamin A Cassava	Provitamin A Maize	Zinc Maize	Zinc Rice	Zinc Wheat
Per Capita Consumption (g/day) ^a	65	70	200	250	170	170	150	70
Baseline Micronutrient Content (mg/kg)	50	47	0	0	0	25	16	25
Micronutrient Retention After Processing, Storage, Cooking ^b	90%	90%	35%	35%	37%	90%	90%	95%
Intake of Nutrient Adjusting for Retention (mg/day)	2.93	2.96	0.00	0.00	0.00	3.83	2.16	1.66
Bioavailability	7%	8%	8%	20%	17%	20%	25%	20%
Amount of Nutrient Absorbed * (mg/day)	0.20	0.22	0.00	0.00	0.00	0.77	0.54	0.33
Physiological Requirement (mg/day)	0.50	0.50	0.28	0.28	0.28	1.39	1.39	1.39
Percent of Estimated Average Requirement (EAR)	41%	44%	0%	0%	0%	55%	39%	24%
Micronutrient Content After Biofortification (mg/kg)	94	77	70	15	15	37	28	37
Micronutrient Retention After Processing, Storage, Cooking	90%	90%	35%	35%	37%	90%	90%	95%
Intake of Nutrient Adjusting for Retention (mg/day)	5.5	4.9	4.9	1.3	0.9	5.7	3.8	2.5
Bioavailability	7%	8%	8%	20%	17%	20%	25%	20%
Amount of Nutrient Absorbed (mg/day)	0.38	0.36	0.41	0.26	0.16	1.13	0.95	0.49
Physiological Requirement (mg/day)	0.50	0.50	0.28	0.28	0.28	1.39	1.39	1.39
Percent of Estimated Average Requirement (EAR)	77%	73%	148%	95%	57%	81%	68%	35%

^a Per capita consumption of staples (g/day) estimates based on FAOSTAT

^b Retention figure accounts for losses due to parboiling and cooking (100-85% retention after milling in non-parboiled rice; 60% retention after milling in parboiled rice; 90% retention from cooking)

*Absorption accounts for intake adjusted for retention and bioavailability