

Inadequate Growth

**Definition/
cut-off value**

An inadequate rate of weight gain as defined below.

A. Infants from birth to 1 month of age:

- excessive weight loss after birth
- not back to birth weight by 2 weeks of age

B. Infants from birth to 6 months of age:

Based on 2 weights taken at least 1 month apart, the infant's actual weight gain is less than the calculated expected minimal weight gain based on the table below. See Attachment 135-A for metric equivalents and for examples.

<u>Age</u>	<u>Average Weight Gain</u>			
Birth - 1 mo	18 gm/day	4 1/2 oz/wk	19 oz/mo	1 lb 3 oz/mo
1-2 mos	25 gm/day	6 1/4 oz/wk	27 oz/mo	1 lb 11 oz/mo
2-3 mos	18 gm/day	4 1/2 oz/wk	19 oz/mo	1 lb 3 oz/mo
3-4 mos	16 gm/day	4 oz/wk	17 oz/mo	1 lb 1 oz/mo
4-5 mos	14 gm/day	3 1/2 oz/wk	15 oz/mo	
5-6 mos	12 gm/day	3 oz/wk	13 oz/mo	

C. Infants & Children from 6 months to 59 months of age:

Option I: Based on 2 weights taken at least 3 months apart, the infant's or child's actual weight gain is less than the calculated expected weight gain based on the table below. See Attachment 135-A for metric equivalents and for examples.

<u>Age</u>	<u>Average Weight Gain</u>			
6 - 12 mos	9 g/day	2 1/4 oz/wk	9 1/2 oz/mo	3 lbs 10 oz/6 mos
12 - 59 mos	2 1/2 g/day	0.6 oz/wk	2.7 oz/mo	1 lb/6 mos

OR

135 (continued)

Option II: A low rate of weight gain over a six (6) month period (+ or- 2 weeks) as defined by the following chart. See Attachment 135-B for guidance on using measurements not taken within a 5-6 month interval.

Column 1	Column 2
<u>Age in months at end of 6 month interval</u>	<u>Weight gain per 6 month interval in pounds</u>
6	≤7
9	≤5
12	≤3
18-60	≤1

Participant category and priority level

Category	Priority
Infants	I
Children	III

Justification

Weight for age is a sensitive indicator of acute nutritional inadequacy. The rate of gain during infancy, especially early infancy is rapid, and abnormalities in rate of weight gain may often be detected in just a few months. There is little question that decrease in the rate of weight gain during infancy is the earliest indication of nutritional failure. In contrast, children beyond infancy grow rather slowly, and many months of observation may be required to demonstrate that the rate of weight gain is unusually slow. During the first eighteen months of life, the rate of change in weight fluctuates and then declines rapidly. Because of this deceleration it may be difficult to differentiate normal growth slowing from an abnormal rate. After 18 months weight gain becomes more linear so assessment becomes easier.

Infants and children with abnormally slow growth can benefit from nutrition and health interventions to improve weight and height gain. The diagnosis of slow growth must consider possible

causes of growth changes including undereating and disease conditions. Undereating, for any number of reasons, and disease conditions are the main causes of abnormally slow growth. Factors associated with undereating by an infant or child include inadequate sources of nutrient dense foods; lack of social support for the caregiver; an adverse social and psychological environment; a disorganized family; depressed parents or caregivers; and the caregiver's lack of education, health and nutrition knowledge, mental and physical abilities, and responsibility for child care. There is good evidence that through nutrition education, supplemental foods, and referrals to other health and social services, participation in the WIC Program will benefit infants and children with slow growth. In keeping with the preventive nature of the WIC Program, a cut-off point approximating the 10th percentile rate of change in weight for age was chosen.

References

1. Baumgartner RN, Roche AF, Himes JH. Incremental growth tables: Supplementary to previously published charts. *Am.J.Clin.Nutr.* 1986;43:711-722.
 2. Fomon SJ. Nutrition of normal infants. St. Louis: Mosby, 1993.
 3. Guo S, Roche AF, Fomon SF, Nelson SE, Chumlea WC, Rogers RR, et al. Reference data on gains in weight and length during the first two years of life. *J.Pediatr.* 1991; 119:355-362.
 4. Institute of Medicine. WIC nutrition risk criteria a scientific assessment. National Academy Press, Washington, D.C.; 1996.
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Metric Equivalents for Average Weight Gain

Infants from birth to 6 months of age (*Need 2 weights taken at least 1 month apart.*)

<u>Age</u>	<u>Average Weight Gain (Metric equivalents)</u>		
Birth - 1 mo	18 gm/day	126 gm/wk	0.54 kg/mo
1-2 mos	25 gm/day	175 gm/wk	0.75 kg/mo
2-3 mos	18 gm/day	126 gm/wk	0.54 kg/mo
3-4 mos	16 gm/day	112 gm/wk	0.48 kg/mo
4-5 mos	14 gm/day	98 gm/wk	0.42 kg/mo
5-6 mos	12 gm/day	84 gm/wk	0.36 kg/mo

Infants & Children from 6 months to 59 months of age (*Need 2 weights taken at least 3 months part.*)

<u>Age</u>	<u>Average Weight Gain (Metric equivalents)</u>			
6 - 12 mos	9 gm/day	63 gm/wk	0.27 kg/mo	1.62 kg/6 mos
12 - 59 mos	2 1/2 gm/day	17 1/2 gm/wk	0.08kg/mo	0.45 kg/6 mos

Examples Using Calculated Expected Minimal Weight

General steps:

1. Determine if time interval between measures is sufficient.
2. Calculate actual weight gain.
3. Calculate expected minimal weight gain using the chart in the definition. (*Note: Due to a variety of reasons, including rounding, different approaches to calculating the expected minimal weight gain may result in slightly different answers.*)
4. Compare the actual weight gain with the calculated expected weight gain to see if person is eligible for WIC using this criterion.

Example #1	<u>Date of Measures</u>	<u>Weight</u>
	09/13/98 (birth)	7 pounds 6 oz
	9/23/98 (10 days old)	8 pounds 1 oz
	10/26/98 (6 weeks & 1 day old)	9 pounds 3 oz

1. interval between birth & 10/26/98 measures = 43 days
2. actual wt gain = 1 pound 13 oz
3. expected minimal weight gain is: (540 gm) + (13 days x 25 gm/day) = 865 gms = 30 oz = 1 pound 15 oz
4. actual weight gain from birth is less than expected minimal weight gain \Leftarrow eligible for WIC using this criterion

Example #2	<u>Date of Measures</u>	<u>Weight</u>
	2/27/00 (17 1/2 months old)	25 pounds
	9/13/00 (24 months old)	26 1/2 pounds

1. interval between two measures is 6 1/2 months
2. actual weight gain = 1 1/2 pound
3. expected minimal weight gain is: (1 pound per 6 months) + (0.5 mo x 2.7 oz/mo) = 1 pound 1.35 oz
4. actual weight gain is MORE than expected weight gain \Leftarrow NOT eligible for WIC using this criterion.

**Steps to calculate a low rate of weight gain
when the 2 weight measurements are
NOT within a 5 1/2 - 6 1/2 month interval**

1. Use the two bullets below to determine if the two measurements were taken within an acceptable time interval for this risk to apply. If they do, proceed to step #2. If they do not, Option II CANNOT be used to determine eligibility for WIC.
 - For Children >5 months through 17 months of age, the 2 measurements must be taken within a 5-7 month range (*remember, for measurements taken within a 5 1/2 - 6 1/2 month interval, you do not need to proceed with steps 2-5, just use the chart to determine the applicability of the risk*).
 - For Children 18 months to <60 months of age, the 2 measurements must be taken within a 4-9 month interval (*remember, for measurements taken within a 5 1/2 - 6 1/2 month interval, you do not need to proceed with the steps 2-5, just use the chart to determine the applicability of the risk*).
2. Plot both weights on an age and sex specific NCHS growth grid.
3. From the chart, choose the **age** from column 1 that most closely matches the child's age when the second weight was taken and choose the **weight gain** from column 2 that corresponds with this age.
4. Add this weight gain figure to the first of the two weights and plot the sum of the weights on the growth grid at a point exactly 6 months from the date of the first weight.
5. Connect the point for the first weight with the point for the sum of the weights with a straight line (*extend the line if there is a seven month interval between the two weights*). If the point for the second weight is on or below the line then the child's growth is inadequate.