

Weighing and Measuring Equipment

4.

PART

Equipment is required to do anthropometric assessment. The most common types of equipment used are scales and measuring boards. Sources for obtaining equipment and tips on what to look for in equipment are listed below. Whatever equipment is chosen, staff need training to ensure its proper use and care. For Title II Cooperating Sponsors,

electronic weighing scales and locally adapted height measuring boards are recommended. Check with the local UNICEF office for their specifications and availability. UNICEF equipment specifications can be found in the supply catalog at: www.supply.unicef.dk/catalogue/index.htm in the 03 Nutrition Section (use Internet Explorer).

4.1. Scales

Scales used in the field should be portable, durable and capable of reading up to 25 kg for children and have 100 gram increments. Spring scales are the most common scale available. There are several different attachments that can be used to help weigh children with spring scales. The size of the child will determine which attachment should be used. For weighing infants, a sling or basket is usually attached to the spring scale. For children, weighing trousers are used to suspend them. These are small pants with straps that the child steps into. The trousers are then hung from the scale by the straps. There are other alternatives than the trousers, but they can be difficult to use for infants and small children. For infants, a cloth folded to hang from the scale with the infant is preferred. For children who are old enough to grasp firmly onto something, a handle is sometimes attached to the scale and the child hangs from it by their hands until their weight is read. Whatever is used to suspend the child, the scale should be zeroed to ensure that the

weight of the trousers, sling or basket is not added to the child's weight.

Oxfam Anthropometric Kit 1 (UNICEF Item No. 0000824) (Survey, screening, monitoring): The Anthropometric Kit contains equipment for measuring the weight and height of children to assess their nutritional status, along with other materials for nutritional surveys. The kit weighs 26 kgs and contains measuring and survey materials for two survey teams, or measuring equipment for 2 feeding centers, and contains:

Oxfam Anthropometric Kit 1

Code	Qty	Description
NK3	2	Backpacks - nylon
NK6	2	Boards - height/length and head block
NK7	4	Books - exercise
NK20	2	Calculators - solar and battery
NK26	4	Clipboards - A4, folding, spring clip
NK29	1	Roll cord 10M x 6mm, polypropylene, endless fibres

Code	Qty	Description
NK30	2	Counters - manual/hand held, metal
NK31	4	Erasers
NK32	2	Forms - evaluation
NK33A	1	Notes on the revised Oxfam Feeding Kits - English
NK33B	1	Notes on the revised Oxfam Feeding Kits - French
NK34	40	Forms - survey
NK39	2	Pads, paper, four colors of paper, 100 pages per pad, 90 x 90mm
NK40	1	Pad, paper, graph, A4 in mm
NK41	10	Pens - BIC ballpoint, black, medium
NK42	4	Pens - large, indelible, black marker
NK44	12	Pencils - HB
NK45	4	Pencil sharpeners - metal, single hole
NK51	4	Rulers, 30cm, transparent, flat, plastic, shatterproof
NK53	2	Scales, 25kg hanging scale, with bar, 3 pants and sling, 100gm graduation
NK55	1	Scissors - 17cm, blended
NK63	4	Tables - random number A4, plasticized
NK64	4	Tables - %Weight-for-height NCHS/CDC/WHO Sex combined, elasticized
NK65	4	Tables, Weight-for-height Z-score NCHS/CDC/WHO Sex combined, plasticized
NK66	2	Tape measures - fiberglass
NK67	50	Tapes, MUAC: red (<11cm), orange (11-12.5cm), white 12.5-13.5cm, green (>13.5cm)
NK68	2	Rolls, tape - metric adhesive
NK77	10	Wallets - A4 transparent plastic, open on 2-sides
Publications - Books		
NK80	2	Food Scarcity and Famine - Oxfam Practical Guide No. 7
NK83	1	MSF Nutrition Guidelines - English
NK84	1	MSF Nutrition Guidelines - French
NK85A	1	Refugee Health Care - Oxfam Practical Guide No. 9 - English
NK85B	1	Refugee Health Care - Oxfam Practical Guide No. 9 - French
NK86	1	Selective Feeding Program - Oxfam Practical Guide I - English
NK87	1	Selective Feeding Program - Oxfam Practical Guide I - French

Unless weighing and measuring equipment is available locally, the Anthropometric Kit should be bought together with the Therapeutic Kit (Kit 4) or supplementary Kit (Kit 2 or Kit 3) for the initial establishment of feeding programs.

Electronic Scales

UNICEF and others have found electronic scales to be durable and flexible especially given the option of weighing the mother with the child. The mother can be weighed with the child. The mother is then weighed without the child. The difference between the two measures is the child's weight. This technique is useful in situations where the child struggles and use of a sling or weighing pants causes stress for the child. An additional advantage is that the weight of the mother is also available.

Each member of the field staff should have their own scale if possible, otherwise it might take longer to do measurements and complete the survey. Several scales that are available for purchase are listed below:

UNICEF Electronic Scale (Item No. 0141015 Scale mother/child, electronic): The scale is manufactured by SECA and is a floor scale for weighing children as well as adults (capacity 150 kg). Weighing capacity from 1 kg to 150 kg in 100 g divisions, accuracy +/- 100 g. Weight of adult on scale can be stored (tared) in memory, allowing the weight of baby or small child held by adult to show on scale indicator. The portable scale, weighing 4 kg, includes a solar cell on-switch (light sensitivity 15 lux) and is powered by long-life lithium battery good for one million weighing cycles. Instructions are available in English, French and Spanish.

The major advantage of this scale is the micro-computer chip so that it can adjust to zero and weigh people quickly and accurately. The child may be weighed directly. If a child is frightened, the mother can first be weighed alone and then weighed while holding the child in her arms, and the scale will automatically compute the child's weight by subtraction. Recent experience in surveys suggests that the scale is appropriate for Cooperating Sponsor use although there have been some difficulties with heat adversely

affecting the scale. The price of this scale is US\$90. For more information contact: UNICEF Supply Division; UNICEF Plads, Freeport; DK-2100 Copenhagen, Denmark; Telephone: (45) 35 27 35 27; Fax: (45) 35 26 94 21; Email: supply@unicef.org; Website: www.supply.unicef.dk. Or contact UNICEF field office: www.unicef.org/uwwide/fo.htm (use Internet Explorer).

UNICEF Hanging Scale (Item No. 0145555 Scale, infant, spring, 25kg x 100g with No. 0189000 Weighing trousers/pack of 5): This is a Salter-type spring scale with a capacity of 25 kg and 100 gram increments. Using this scale requires that the child be dressed in a set of plastic or nylon trousers before being weighed. The interviewers will need several pairs of these special trousers if they are going to use hanging scales. A hook for hanging the scale from a door or a ceiling beam may also be necessary. The scale should be checked periodically with standard 5 or 10 kg weights. This beam-and-spring or dial type scale has two suspension hooks, an adjustment screw on top, and should be suspended from a solid support. The 1 kilogram scale is easy to transport and practical to use. Provided WITHOUT weighing trousers. Weighing trousers must be ordered separately, in the proportion of 1 scale per 1 pack of 5 trousers, item no. S0189000, in pack of 5. The price of this scale is about US\$30. For more information contact: UNICEF Supply Division; UNICEF Plads, Freeport; DK-2100 Copenhagen, Denmark; Telephone: (45) 35 27 35 27; Fax: (45) 35 26 94 21; Email: supply@unicef.org; Website: www.supply.unicef.dk. Or contact UNICEF field office: www.unicef.org/uwwide/fo.htm (use Internet Explorer).

TALC Weighing Scale: The TALC scale can be used like any other hanging scale, with the advantage that a growth chart can be put in it, and the child's weight is marked directly from the pointer on the spring. The TALC scale can be made locally from a TALC starter kit. This includes three springs, instructions and three specimen growth charts. The scale can also be made from local materials with the purchase of the TALC scale spring and instructions. A TALC sample pack includes spring, hook, nylon cord, wood pieces, screws and instructions (approximately US\$25). These

can be ordered from: Teaching Aids at Low Cost, P.O. Box 49, St. Albans, Herts AL1 4AX, England; Telephone: (44) 0 1727 853869; Fax: (44) 0 1727 846852; Website: www.talcuk.org. Payments from overseas must be made by: (1) International Money Order, National Giro or U.K. Postal Order; (2) Sterling check drawn on a U.K. bank; (3) Eurocheque made out in Sterling; (4) US dollar check drawn on US bank using the correct rate of exchange; or (5) UNESCO Coupons.

Suspended Infant Weighing Pack (Model No. PE-HS-25): This scale was developed in conjunction with the US Centers for Disease Control (CDC). It is a dial scale made of durable plastic with an easy to read face. It is capable of weighing up to 25 kg in 100 gram increments. The one-kilogram pack includes a sling, weighing trousers, a detachable handle for weighing larger children and a vinyl shoulder bag. The price is US\$150. Additional slings, trousers and handles are available for US\$12. For information on this pack contact: Perspective Enterprises; 7829 Sprinkle Road; Portage, MI 49002, USA; Telephone: (269) 327 0869 or (800) 323 7452; Fax: (269) 327 0837; Email: pepdc@perspectiveent.com; Website: www.perspectiveent.com.

Chasmors Ltd. Model MP25: This is a lightweight scale with a stainless steel case and an unbreakable plastic cover. It is easy to read and can weigh up to 25 kg in 100 gram gradations. The scale comes with two weighing trousers and one sling (for newborns). The price is US\$75. Chasmors also carries a variety of arm circumference measuring tapes ranging from US\$10 to US\$30. For more information on their products contact: CMS Weighing Equipment, Ltd.; 18 Camden High Street; London NW1 OJH, U.K.; Telephone: 01 387 2060; (44) 020 7383 7030.

Salter Model 235-6S: This is a lightweight scale in a durable non-rust metal case with an unbreakable plastic face. Its capacity is 25 kgs with 100g increments. The price is US\$77. For more information contact: Salter Industrial Measurement, Ltd.; George Street, West Bromwich; West Midlands, B70 6AD, U.K.; Telephone: (44) 121 553 1855. In the US - Salter Weighing Products; 3620 Central Avenue, N.E., Minneapolis, MN 55418;

Telephone: 800 637 0529; Fax: (612) 781 4320; Email: sales@salterweighing.com; Website: www.salterweighing.com.

Website: www.transfer.be. Telephone: 32 (0) 52 261 000. Fax: 32 (0) 52 261 001. Use Acrobat Reader to read the supply catalog.

Medecins sans Frontieres Nutrition Survey Kit (MSF code: KMEDKNUT4M): This kit includes standard equipment for surveys, including a Salter hanging scale. It comes in one box and weighs 23 kgs. The price is approximately US\$600. The kit can be bought at TRANSFER (formerly associated with MSF-Belgium). TRANSFER can be contacted by email at office-transfer@msf.be.

4.2. Length/Height Boards

Length/height boards should be designed to measure children under 2 years of age lying down (recumbent), and older children standing up. The board should measure up to 120 cm (1.2 meters) for children and be readable to 0.1 of a centimeter. A measuring board should be lightweight, durable and have few moving parts. The metal part on the boards absorbs heat easily so care must be taken in field conditions. Another concern with length/height boards is that they resemble coffins and this can be disconcerting to the caregiver. Check with the survey personnel and adjust the design. Provide adequate training both in using the equipment and in providing appropriate information for the caregiver. Ideally, each field staff should have their own board. This makes the survey process more efficient than when boards have to be shared. Several types of length and height boards are available and are listed below. The Dutch infant-child-adult measuring board is recommended but local adaptations are possible to reduce the cost.

UNICEF Model (Item No. 0114500 Infant length/height measuring board): An infant/child height measuring board measuring both recumbent length and standing height. This board is made of smooth-finish wood with all parts glued and screwed; height is 130 cm (collapses to 75 cm); width 30 cm; with an estimated weight of 10 kg. The board comes with a shoulder strap. Illustrated

instructions for assembly and use are included, as well as guidelines and plans for local construction. The price of the board is about US\$350. For more information contact: UNICEF Supply Division; UNICEF Plads, Freeport; DK-2100 Copenhagen, Denmark; Telephone: (45) 35 27 35 27; Fax: (45) 35 26 94 21; Email: supply@unicef.org; Website: www.supply.unicef.dk. Or contact UNICEF field office: www.unicef.org/uwwide/fo.htm (use Internet Explorer).

Infant/Child Height/Length Measuring Board: This board has 130 cm capacity (collapses to 75cm) and has 0.1 cm increments. The board weighs 6 kg, is portable, water-resistant and has an adjustable, removable nylon shoulder strap. It is easy to assemble and dismantle, with the sliding head-footpiece stored in the base of the board for transport or storage. This board has a lifetime warranty and costs \$285. For more information contact: Shorr Productions; 17802 Shotley Bridge Place; Olney, Maryland 20832, USA; Telephone: (301) 774 9006; Fax: (301) 774 0436; Email: ijshorr@shorrproductions.com.

Infant Recumbent Length Board (Model No. PE-RILB-122-PC): This board is lightweight, durable and capable of measuring recumbent length up to 100 cm. The price of this board is US\$215. For more information contact: Perspective Enterprises; 7829 Sprinkle

Road; Portage, MI 49002, USA; Telephone: (269) 327 0869 or (800) 323 7452; Fax: (269) 327 0837; Email: pepdc@perspectiveent.com; Website: www.perspectiveent.com.

Recumbent Length Measuring Board: This board has 106 cm capacity in 0.1 cm increments and costs \$185. For more information contact: Shorr Productions; 17802 Shotley Bridge Place; Olney, Maryland 20832, USA; Telephone: (301) 774 9006; Fax: (301) 774 0436; Email: ijshorr@shorrproductions.com.

Infant Measuring Board (Model No. PE-RILB-LTWT): This measuring board is designed to be especially lightweight and extremely portable. It can measure up to 100 cm, is collapsible and comes with a vinyl plastic tote bag. The price of this board is US\$250. For more information contact: Perspective Enterprises; 7829 Sprinkle Road; Portage, MI 49002, USA; Telephone: (269) 327 0869 or (800) 323 7452; Fax: (269) 327 0837; Email: pepdc@perspectiveent.com; Website: www.perspectiveent.com.

Portable Adult/Infant Measuring Board (Model No. PE-AIM-101): This is an adjustable measuring board which has been extensively used by World Health Organization (WHO) and CDC, with a vertical aluminum post. It can measure the height of adults and then by taking off its vertical extension it can be adapted to measure infants. When collapsed, it is approximately the length of two briefcases laid end to end. It also has an optional vinyl carrying case. The price of this board is US\$385. For more information contact: Perspective Enterprises; 7829 Sprinkle Road; Portage, MI 49002, USA; Telephone: (269) 327 0869 or (800) 323 7452; Fax: (269) 327 0837; Email: pepdc@perspectiveent.com; Website: www.perspectiveent.com.

Infant/Child/Adult Height/Length Measuring Board: This measuring board has a 200 cm capacity (collapses to 85 cm) and has 0.1 cm increments. The board weighs 6 kg, is portable, water-resistant and has an adjustable, removable nylon shoulder strap. It is easy to assemble and dismantle and costs US\$355. For more information contact: Shorr

Productions; 17802 Shotley Bridge Place; Olney, Maryland 20832, USA; Telephone: (301) 774 9006; Fax: (301) 774 0436; Email: ijshorr@shorrproductions.com.

Adult Measuring Device (Microtoise) (UNICEF No. 0114400 Height measuring instrument (0-2 m)): This lightweight portable tape is wall mounted and fits easily into the package needed for field measurements. Made of plastic, the Microtoise measures up to 2 meters and is available at a price of approximately US\$20. For more information contact: UNICEF Supply Division; UNICEF Plads, Freeport; DK-2100 Copenhagen, Denmark; Telephone: (45) 35 27 35 27; Fax: (45) 35 26 94 21; Email: supply@unicef.org; Website: www.supply.unicef.dk. Or contact UNICEF field office: www.unicef.org/uwwide/fo.htm (use Internet Explorer).

Adult Measuring Device (Harpenden Pocket Stadiometer): An inexpensive height measuring device useful for children over 24 months and adults (range 0-200cm). The price is approximately US\$100. Contact: CMS Weighing Equipment, Ltd.; 18 Camden High Street; London NW1 OJH, U.K.; Telephone: 01 387 2060; (44) 020 7383 7030.

Medecins sans Frontieres Height Measuring Apparatus (MSF code: EMEQMEEA5P): Supplied by MSF Holland, the 7.3 kg pack contains an aluminum board for child or adults (max height is 200 cm). Children under 2 years of age are measured lying down. The price is approximately US\$270. The kit can be bought at TRANSFER (formerly associated with MSF-Belgium). TRANSFER can be contacted by email at office-transfer@msf.be. Website: www.transfer.be. Telephone: 32 (0) 52 261 000. Fax: 32 (0) 52 261 001. Use Acrobat Reader to read the supply catalog.

Local Construction: Various plans exist for the local construction of foldable height/length boards and they can be made for around US\$20. It is important that the materials are durable, lightweight and the wood should be well seasoned to guard against warping. Sealing the wood with water repellent and ensuring the measuring tape is protected from wear will improve the durability of the

board. The tape measure should be durable with 0.1 cm increments and the numbers of the tape measure must be next to the markings on the board when the measure is glued to the side of the board. The boards should be long enough to measure children up to 5 years and a “correction” factor is needed to convert recumbent length to standing height for children over 24 months in order to use the WHO/NCHS growth reference standards. Designs can be found in Annex 4 of the FAO field manual. Blueprints for the construction of portable measuring boards are available from the Nutrition Division of Cornell University as well as from the Center for Health Promotion and Education of the Centers for Disease

Control and Prevention, 1600 Clifton Road, N.E., Atlanta, GA 30333, USA; Website: www.cdc.gov.

4.3. Mid-Upper Arm Circumference Measure

MUAC Tape (UNICEF Item No. 145600 Arm circumference insertion tape/pack of 50): This arm circumference insertion tape measures mid-upper arm circumference of children, up to 25 cm. Color-coded in red/yellow/green, non-tear, stretch-resistant plasticized paper. Supplied in pack of tapes together with written and pictorial instructions for use. Refer to UNICEF’s Supply Division in Copenhagen through any UNICEF field office.

For more information contact: UNICEF Supply Division; UNICEF Plads, Freeport; DK-2100 Copenhagen, Denmark; Telephone: (45) 35 27 35 27; Fax: (45) 35 26 94 21; Email: supply@unicef.org; Website: www.supply.unicef.dk. Or contact UNICEF field office: www.unicef.org/uwwide/fo.htm (use Internet Explorer).