70.

London School of Hygiene and Tropical Medicine.

A III.

MOTHERS' COMMITTEE FOOD (SUMMER 1929).

Family Dietary for Man, Wife, 3 children aged 8, 6 and 3 years.

Man = 1.00 + Wife = .83 + 8yr. = .70 + 6yr. = .60 + 3yr. = .50 = 3.63
Weekly man value = 3.63 x 7 = 25.41.

Item	Weight	in grams. C.H.O.	Pro.	Fat.	Cals.
Beef	5 lb.	-	333.5	442.5	5480.0
Rabbit	2 "	0.8	113.4	40.8	848.0
Suet	1 "	-	5.4	423.2	3958.0
Fish	3 "	-	194.4	70.2	1452.0
Cheese	¾ "	10.6	87.5	119.1	1508.25
Eggs	¾ "	4.7	37.7	34.4	494.25
Milk	22 pts.	598.4	411.4	448.8	8316.0
Butter	1 lb.	-	0.9	376.5	3503.0
Lard	½ "	-	-	226.8	2109.5
Dripping	1 "	-	-	453.6	4219.0
Flour	3 "	1007.1	172.8	18.9	5016.0
Bread	26 "	5673.2	850.2	23.4	26962.0
Cornflour	¼ "	99.3	0.9	0.1	412.0
Oatmeal	3 "	952.5	162.0	117.0	5658.0
Rice	1 "	362.9	30.8	2.7	1640.0
Peas (dried)	1½ "	428.7	138.2	4.8	2368.5
Sugar	3 "	1360.8	-	-	5580.5
Cocoa	¼ "	45.7	20.5	30.4	553.8
Jam	2 "	629.6	2.8	-	2592.0
Cabbage	3 "	85.8	19.8	1.3	447.0
Turnips	1 "	20.0	5.4	.5	108.0
Carrots	1 "	43.6	5.4	.5	205.0
Lettuce	¼ "	2.3	1.1	.2	16.0
Potatoes	9 "	775.8	85.5	1.8	3555.0
Apples	2 "	88.8	2.6	1.8	392.0
Oranges	1 "	29.9	2.7	.4	137.0
Prunes	1 "	153.8	11.3	.9	685.0
		12374.3	2696.2	2840.6	88215.3
Weekly per man value	=	487.0 gr.	106.1 gr.	111.8 gr.	3471.7

Tot. An. Pro. 1184.2 = 46.6 gr. %C.H.O. = 57.5
Tot. An. Fat. 2635.9 = 103.7 gr. %Pro. = 12.5
A.P.to Tot.P. 43.9% %Fat. = 30.0
A.F.to Tot.F. 92.8%

Daily per man value

Milk	= .866 pt.	(roughly ⅞ pt.)
Butter	= .039 lb.	(" 5/8 oz.)
Meat, Fish, Eggs	= .423 lb.	(" 7 oz.)
Potatoes	= .354 lb.	(" 5½ oz.)
Fr. Fruit and Veg.	= .325 lb.	(" 5 oz.)
Bread	= 1.023 lb.	
Sugar	= .118 lb.	(" 2 oz.)

Amount spent on Food	28/10	= 48.1%	= 1.13/- per man per day (1/1½).
" " " Rent	13/6	= 22.5%	
" " " Clothing	5/-	= 8.3%	
" " " Fuel and Light	3/7	= 6.0%	
" " " All other items	9/1	= 15.1%	
	60/0	100.0	

Food level in July 1929 = 150% of July 1914
" " " " " "

London School of Hygiene and
Tropical Medicine.

B III

November 1931

MRS. W'S DIETARY

Unemployed "Dole" 27/3

Husband and wife and 2 children aged 6 and 8 years.

Man = 1.00 + Wife = .83 + 8 yr. = .70 + 6 yr. = .60 = 3.13
Weekly man value = 3.13 x 7 = 21.91.

Item	Weight	C.H.O. (in grams.)	Pro. (in grams.)	Fat. (in grams.)	Cals.
Beef (mince)	1 lb.	-	66.7	88.5	1096.0
Veal	½ "	-	37.2	7.7	224.5
Rabbit	1 "	0.4	56.7	20.4	424.0
Haddock	½ "	-	27.2	0.5	116.0
Herring	1 "	-	65.8	47.2	709.0
Eggs	1⅜ "	8.7	69.2	63.0	906.1
Milk (fresh)	7½ pts.	204.0	140.3	153.0	2835.0
" (evap.)	¼ lb.	13.6	10.2	10.0	190.5
Butter	¾ lb.	-	.7	282.4	2627.3
Dripping	½ "	-	-	226.8	2109.5
Margarine	1½ "	-	1.4	577.1	5368.5
Sausages (beef)	½ "	34.5	25.4	40.2	619.0
Flour	1 "	335.7	57.6	6.3	1672.0
Bread	16 "	3491.2	523.2	14.4	16592.0
Oatmeal	½ "	158.8	27.0	19.5	943.0
Cocoa	¼ "	45.7	20.5	30.4	553.8
Sugar	2 "	907.2	-	-	3720.0
Currants	½ "	95.3	3.9	0.7	413.0
Cabbage	1 "	28.6	6.6	0.45	149.0
Carrots	2 "	87.2	10.8	0.9	410.0
Parsnips	1 "	83.0	6.8	1.8	385.0
Onions	2 "	98.0	11.8	0.8	458.0
Turnip	1 "	20.0	5.4	0.45	108.0
Potatoes	6 "	517.2	57.0	1.2	2370.0
		6129.1	1231.4	1593.6	44999.2
Weekly per man value	=	279.7 gr.	56.2 gr.	72.7 gr.	2053.8

Tot. An. Pro. 474.0 = 21.6 gr. %C.H.O. = 55.9
Tot. An. Fat. 899.5 = 41.1 gr. %Pro. = 11.2
A.P.to Tot.P. 38.4% %Fat. = 32.9
A.F.to Tot.F. 56.5%

Daily per man value

Milk (fresh)	= .342 pt.	(roughly ⅓ pt.)
Butter	= .034 lb.	(" ½ oz.)
Meat, Fish, Eggs	= .245 lb.	(" 4 oz.)
Potatoes	= .274 lb.	(" 4½ oz.)
Fr. Fruit and Veg.	= .319 lb.	(" 5 oz.)
Bread	= .730 lb.	(" 12 oz.)
Sugar	= .091 lb.	(" 1½ oz.)

Amount spent on Food	12/11	= 47.4%	= .590/- per man per day (7d.)
" " " Rent	10/ -	= 36.7%	
" " " Clothing	-	-	
" " " Fuel and Light	1/2	= 4.3%	
" " " All other items	4/9½	= 17.6%	
	28/10½	106.0	

Food level in November 1931 131% of July 1914
" " " " " "

Department of Industrial Physiology,
London School of Hygiene and
Tropical Medicine.

MECHANISMS OF VENTILATION.

NATURAL VENTILATION.

The movement of air in and out through doors, windows, skylights and "ventilators" of various kinds is due to two causes :- the difference in density of the inside and outside air and the effects of winds. The theoretical rate of flow (hence the quantity) in and out of a warm room through openings at different levels can be calculated from the differences of temperature and humidity inside and out. Warm, moist air is lighter than cold air, so the cold air always tends to enter at the bottom of a room and the hot air to escape from the upper parts.

The provision of known amounts of natural ventilation has received little attention. Vernon, Bedford and Warner (ref. 1) have measured and expressed natural ventilation as square feet of opening (windows, etc.) per 100 square feet of floor. Angus (ref. 2) has described an investigation of natural ventilation where an Opening Factor, 'O', was found for different enclosures: 'O' being the square feet of opening per 1,000 cubic feet of enclosed space.

In default of anything better the following table gives suggested values for 'O' for different buildings, these being maximum values with all windows fully open.

Offices	3 Opening Factor
Laboratories	4 - 5
Chemical Laboratories	5
Light manual Work on cool process	5 - 6
Light Manual work in moderate heat	6 - 7
Heavy work, great heat	9 - 11

Tobin Tubes, "Sheringham" ventilators, and gussetted hopper windows are designed to introduce air without causing draughts, unless provided with fans or heating arrangements they always admit less air than a plain opening of equal area. The same applies to all types of roof ventilators, only here those of good design exert a definite suction whenever a wind blows. But it must be remembered that ventilation is most needed on windless days.

MECHANICAL VENTILATION.

Fans are of three types:-

Propellor Type — Cheap; moves large quantities of air at a low velocity;; must not be made to work against a pressure of more than 1/8" water gauge for best effect, nor to exhaust against a wind. Stopping the air flow overloads the motor. (Ref. 3).

Centrifugal Fans. — Used in all air conditioning apparatus and where air has to be driven through long ducts. Can be designed to work against all usual pressures. Generally designed so that, unlike the propellor fan, throttling the air outlet lessens the load on the motor.

Aerofoil fans — Davidson's "Aeroto". The latest development, an outcome of aeroplane research. Not cheap to make but extremely efficient and can work up to quite high pressures.

PERSONAL COOLING. in hot atmospheres by creating air movement. Where for any reason it is impracticable or too expensive to change the air of a factory, or a building such as a large office, sufficiently fast to keep down the temperature, a useful palliative is found in air movement.

Under all usual circumstances a movement of air exerts an increased cooling effect, demonstrable by the kata-thermometer and also by the sensations.

Such a cooling effect can be produced in offices by desk fans, on ships by "punkah-louvres", in factories by "jet-fans" (Ref.2) and heater units with the heat turned off, and in restaurants by overhead "paddles" or fans on vertical axes.

REFERENCES.

1. Vernon, Bedford and Warner. Industrial Health Research Board Report No. 58.

2. "The Ventilation of English Factories and Workshops in Hot Weather". Angus, T.C. Journ. Industrial Hygiene Vol. IV, No. 11, p.479, March 1923.

3. "Ventilation of Factories and Workshops". Home Office, 2nd Edition. No. 5. 1933.

4. "The Principles of Heating and Ventilation". H.M.Vernon. Arnold. 1934.

5. "Ventilation, A Textbook for Students and Engineers". E.L.Joselin. Arnold 1934.

6. Lehmberg, Brandt and Morse. Heating, Piping and Air Conditioning, Vol. 7, No. 1, p.44, January 1935.

7. Bedford, T. "The Warmth Factor in Comfort at Work" Industrial Health Research Board Report No. 76. London: H.M.S.O. 1936.

8. Bedford, T. "Modern Principles of Ventilation and Heating". London: H.K.Lewis & Co. 1937.

Tropical Medicine.

MAN-VALUE COEFFICIENTS.

I. Inter-Allied Scientific Food Commission, March 1918.

Male 13 +	1·00
Female 13 +	·83
Both Sexes 10-13	·83
" " 6-10	·70
" " 0-6	·50

II. Cathcart (M.R.C. Sp. Rep. 151), 1931.

Male 14 +	1·00
Female 14 +	·83
Both Sexes 12-14	·90
" " 10-12	·80
" " 8-10	·70
" " 6-8	·60
" " 3-6	·50
" " 2-3	·40
" " 1-2	·30
" " 0-1	·20

III. International Conference. Rome, Sept. 1932.

Both Sexes over 60	·80
Male 14-59	1·00
Female 14-59	·80
Both Sexes 12-13	·80
" " 10-12	·70
" " 8-10	·60
" " 6-8	·50
" " 4-6	·40
" " 2-4	·30
" " 0-2 *	·20

* Age group 0-2 = from birth up to and including the 24th month of age.

Industrial Physiology,
London School of Hygiene and
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Lecture and Practical Course,
D.P.H. Easter Term, 1938.

SESSION 1937-38

PHYSIOLOGY APPLIED TO HYGIENE AND INDUSTRY AND METEOROLOGY.

Date	Time	Detail
1938		
Tuesday Jan.18th	2 - 3	Physiological problems met with in Industry: factors influencing the health, comfort and efficiency of workers: physiological rationalization of industrial work.
	3 - 4	Atmospheric conditions and the industrial worker. (Dr. Bedford).
	4 - 5	Vibration and Noise.
Thursday Jan.20th	3 - 4	Care of vision: effects of bad lighting: prevention of eye strain and accidents in industry.
	4 - 5	Lighting, natural and artificial: standards of illumination. (Mr. Angus).
Tuesday Jan. 25th	2 - 3	Illumination (cont.): daylight factor measurement: insolation of buildings. (Mr. Angus).
	3.15-5	Visit to Laboratories of Electric Lamp Manufacturers Association, 2, Savoy Hill, W.C.2. (Bus 77 from Russell Square to Strand).
Thursday Jan. 27th	3 - 5	Practical: measurement of daylight and artificial illumination: reflectivity of wall surfaces: effects of glare.
Tuesday March 22nd	3 - 4	Physiology of hearing: detection and prevention of deafness in schoolchildren.
	4 - 5	Demonstration: Use of gramophone audiometer in schools.
Thursday March 24th	3 - 4	Recent advances in "First Aid": artificial respiration: carbon monoxide poisoning and electric shock.
	4 - 5	Demonstration: resuscitation apparatus and methods: use of CO_2 and O_2 in asphyxia.
Tuesday March 29th	3 - 4	Protection against Gas: individual and collective.
	4 - 5	Tutorial: general revision.