

Heavy weapons algorithm:

Figure in

(# of known fortifications)

(% probability of hit/miss)

(% of expected losses in heavy weapon crews)

To eventually = Number of heavy weapon systems or rounds
required to
insure neutralization of threats.

Vision Algorithm: (night operations)

$(\% \text{ of moon} + 5\%) - (\% \text{ of cloud cover}) - (\% \text{ of tree cover}) = X$

If $X > 5$ than $X=Y$

If $X < 5$ than $5=Y$

$Y * (50\% \text{ if no NVG present or if not running IR on Gen 1 or sub Gen1 systems}) * (2 \text{ if Gen 2+ NVG in use by unit}) = \text{Area observable to single unit in meters.}$

Supply/combat effectiveness Algorithm:

Block of time unit is supplied to operate in (reflected in hours) = X

X * 75% = Unit condition 2 (requires resupply soon)

X * 95% = Unit condition 3 (Immediate resupply required unit 75% effective)

X * 125% = Unit condition 4 (Unit critically low 50% combat effective)

X * 200% = Unit condition 5 (no longer combat effective)

Troop Movement

- I. Unchallenged Movement
 - a. Road march
 - i. 4 Km per hour
 - ii. 15 min per kilometer
 - iii. 1.5 min per 100 meters
 - b. Cross country march (even terrain)
 - i. 3 km per hour
 - ii. 20 min per kilometer
 - iii. 2 min per 100 meters
 - c. Cross country march (restrictive or hilly terrain)
 - i. 2 km per hour
 - ii. 30 min per kilometer
 - iii. 3 min per 100 meters
 - iv. Multiply * 2 for restrictive AND hilly.
- II. Tactical Movement
 - a. Road patrol
 - i. 3 km per hour
 - ii. 20 min per kilometer
 - iii. 2 min per 100 meters
 - b. Cross country patrol (even terrain)
 - i. 2 km per hour
 - ii. 30 min per kilometer
 - iii. 3 min per 100 meters
 - c. Cross country patrol (restrictive or hilly terrain)
 - i. 1 km per hour
 - ii. 6 min per 100 meters.
 - iii. Multiply * 2 for restrictive AND hilly

Food Algorithms

For Officers:

Exertion Levels:

Level A = Heavy Exertion Level (Sustained Combat Operations)

Level B = Moderate Exertion Level (Mixture of Combat/Garrison)

Level C = Light Exertion Level (Garrison Duty)

Level D = Rationed Intake Level (Low food reserves)

Caloric Needs for Each Level:

Level A = 3300 cal/day or 137.5 cal/hr

Level B = 2800 cal/day or 116.6 cal/hr

Level C = 2200 cal/day or 91.6 cal/hr

Level D = 1200 cal/day or 50cal/hr

Total Caloric Needs Per Day Algorithm:

TCN=Total Caloric Need

EL = Exertion Level in Cal/hr

TH=Time in Hours at Exertion Level

$$TCN= EL \times TH$$

For Multiple Tasked Situations

$$TCN= (EL \times TH) + (EL \times TH) + (EL \times TH)$$

Caloric output for C Ration:

24hrs = 2830cal

12hrs = 1415cal

6hrs = 708cal

3hrs = 354cal

Caloric Output for 24 Hour Prepackaged Rations:
3300 Calories or 137.5 cal/hr

Caloric Output for Garrison Ration (Hot/Cooked Ration)
1700 Calories or 70.8 cal/hr

For Enlisted Soldiers:

Exertion Levels:

Level A = Heavy Exertion Level (Sustained Combat Operations)

Level B = Moderate Exertion Level (Mixture of Combat/Garrison)

Level C = Light Exertion Level (Garrison Duty)

Level D = Rationed Intake Level (Low food reserves)

Caloric Needs for Each Level:

Level A = 3100cal/day or 129.1 cal/hr

Level B = 2400cal/day or 100.0 cal/hr

Level C = 2000cal/day or 83.3cal/hr

Level D = 800 cal/day or 33.3cal/hr

Total Caloric Needs Per Day Algorithm:

TCN=Total Caloric Need

EL = Exertion Level in Cal/hr

TH=Time in Hours at Exertion Level

$$TCN= EL \times TH$$

For Multiple Tasked Situations

$$TCN= (EL \times TH) + (EL \times TH) + (EI \times TH)$$

Caloric output for C Ration:

24hrs = 2400cal

12hrs = 1200cal

6hrs = 600cal

3hrs = 300cal

Caloric Output for 24 Hour Prepackaged Rations:

2000 Calories or 83.3cal/hr

Typical 24 Hour Ration:

1 can Conserva

1 small can Pate

10 pc Hardtack

1 pc Bread

Vitamin/Supplement Ration

2 Tea Bags

Sugar

1pc Candy

Caloric Output for Garrison Ration (Hot/Cooked Ration)

1100 Calories or 45.8cal/hr

Water Algorithms

Water Output/Input:

Average output of water through exertion/urination:

24hrs = 2.5L

.10 L/hr

Average input of water through hydration:

24hrs = 3.0L = 96 fluid ounces

12hrs = 1.5L = 48 fluid ounces

6hrs = .75L = 24 fluid ounces

3hrs = .37L = 12 fluid ounces

1.5hrs = .18L = 6 fluid ounces

1.0hrs = .10L = 4 fluid ounces

Exertion Levels:

Level A = Heavy Exertion Level (Sustained Combat Operations)

Level B = Moderate Exertion Level (Mixture of Combat/Garrison)

Level C = Light Exertion Level (Garrison Duty)

Level D = Rationed Intake Level (Low water reserves)

Hydration Needs for Each Level:

Level A = 4.0 L/24hrs or 128 fluid oz. or .16L/hr (5.3 fluid oz/hr)

Level B = 3.0L/24hrs or 96 fluid oz or 0.12L/hr (4.0 fluid oz/hr)

Level C = 2.5L/24hrs or 80 fluid oz or 0.10L/hr (3.3 fluid oz/hr)

Level D = 1.0L/24hrs or 32 fluid oz or 0.04L/hr (1.3 fluid oz/hr)

Hydration Algorithm:

THN=Total Hydration Need

EL= Exertion Level

TH=Time in Hours at Exertion Level

$$\text{THN} = \text{EL} \times \text{TH}$$

For Multiple Tasks in 24 hr periods

$$\text{THN} = (\text{EL} \times \text{TH}) + (\text{EL} \times \text{TH}) + (\text{EL} \times \text{TH})$$