| **Factor B: Fullness** | | | | | |
| --- | --- | --- | --- | --- | --- |
| Factor A:  Weight |  | Empty | Full |  |  |
| Normal | n=20  $\overline{X}=22$  T=440  SS=1540 | n=20  $\overline{X}$ =15  T=300  SS=1270 | $T_\text{Normal}=740$ |  |
| Obese | n=20  $\overline{X}$ = 17  T=340  SS=1320 | n=20  $\overline{X}$ = 18  T=360  SS=1266 | $T_\text{obese} = 700$ |  |
|  | $T_\text{empty} =780$ | $T_\text{full} = 660$ |  | G=1440  N=80  $\Sigma{X^2}=31836$ |

양식의 맨 위

양식의 맨 아래

$\overline{X_{t}}= 18 $   
$\overline{X_{t}}^2= 324 $   
$N = 80 $   
$N*(\overline{X_t}^2) = 25920 $   
$\sum{X^2} - N*(\overline{X_t}^2) = 31836 - 25920 = 5916$

step 1. Build hypotheses   
step 2. Locate the critical range for F-ratio. calculate the $dfs$

1. $df_{total}$ 79 N-1
2. $df_{within}$ 76 N-k
3. $df_{between}$ 3 k-1
4. $df_A$ 1 number of levels of a – 1
5. $df_B$ 1 number of levels of b -1
6. $df_{AxB}$ 1 df between - df A - df B

Compute F-ratio   
SS

1. $SS_{total}$

$\overline{X_{t}}= 18 $   
$\overline{X_{t}}^2= 324 $   
$N = 80 $   
$N*(\overline{X_t}^2) = 25920 $   
$\Sigma{X^2} - N*(\overline{X_t}^2) = 31836 - 25920 = 5916$

1. $SS_{within}$

$SS_{within} = \Sum{SS_{within}} = 1540 + 1270 + 1320 + 1266 = 5396$

1. $SS_{between}$ 520 (SS total – SS within)
2. $SS_A$ 20 ((TA1)2+(TA2)2)/n – (G2/N)
3. $SS_B$ 180 ((TB1)2+(TB2)2)/n – (G2/N)
4. $SS_{AxB}$ 320 (SS between - SSA - SSB)

MS

1. $MS_{A}$ 20(SSA/df A)
2. $MS_{B}$ 180(SSB/df B)
3. $MS_{AxB}$ 320(SS A\*B / df A\*B)
4. $MS_{Within}$ 71(SS within / df within)

F-ratio

1. $F_{A}$ 20/71 (MSA/MSwithin)
2. $F_{B}$ 180/71 (MSB/MSwithin)
3. $F_{AxB}$ 320/71 (MSAxB/MSwithin)

| **Table 1. Mean number of crackers eaten in each treatment condition** | | | |
| --- | --- | --- | --- |
|  |  | Fullness | |
|  |  | Empty stomach | Full stomach |
| Weight | Normal | M=22  SD=9.00 | M=15  SD=8.18 |
| Obese | M=17  SD=8.34 | M=18  SD=8.16 |

양식의 맨 위

양식의 맨 아래

| **Table 2. Result** | | | | |
| --- | --- | --- | --- | --- |
| Source | SS | df | MS | F |
| Between treatment | 520 | 3 |  |  |
| - Factor A (weight) | 20 | 1 | 20 | 20/71 |
| - Factor B (fullness) | 180 | 1 | 180 | 180/71 |
| - A x B interaction | 320 | 1 | 320 | 320/71 |
| Within treatment | 5396 | 76 | 71 |  |
| Total | 5916 | 79 |  |  |
| weigth x fullness factorial design | | | | |

크래커 실험 결과 몸무게와 포만감은 결과에 영향을 미치지 않는다. 하지만 몸무게와 포만감의 상호작용을 하는 경우엔 크래커를 먹는 양에 변화가 있을 것이다. (영향이 있음.)