1.7

(1) Control：the groups of 16 females birds were **not given** supplementary diets before and during egg laying。

Treatment：the groups of 16 females birds were **given** supplementary diets before and during egg laying.

(2) Does egg coloration be an indication of female collared flflycatchers quality?

(3) darkness of blue color in eggs. Numerical.

1.15

(1) Experiment

(2) Control:The groups of chicks that **nonsupply** vitamin.

Treatment:The groups of chicks that **supply** vitamin.

(3) In order to make the distribution of a large number of uncontrollable non research factors between the control groups and treatment groups as balanced as possible(textbook P26)

1.18

(1) Observational studies

(2) No.there are other variables can make muscle cramps,like drink more coffer or sleep less.

(3) sleep less can cause muscle cramps.

drink more coffer can cause muscle cramps.

3.13 设感染 Hepatitis C 病人数为 X，$X \sim B(5, 0.3)$

$P(X=3) = C_5^3 0.3^3 (1-0.3)^2 = 10 \times 0.3^3 \times 0.7^2 = 0.1323$

3.17 (a) 人数：$200 \times 0.12 = 24$ ⇒ 预计有24人阳性血液。

(b) 设发生阳性病人数为 X

$P(X>30) = 1 - [P(X=0) + P(X=1) ----- + P(X=30)] = 1 - [C_{30}^0 0.12^0 0.88^{30} + C_{30}^1 (0.12)^1 (0.88)^1 \cdots]$

$= 1 - 0.918 = 0.082$

3.21 (a) P查表得 $P(X<2.60) = 0.9953$ ⇒ $P(X>2.6) = 1 - 0.9953 = 0.00467 \approx 0.0047$

(b) $P(X<1.35) = 0.9115$

(c) $P(-1.70<X<3.10) = P(X<3.10) - P(X<-1.70) = 0.9990 - 1 + 0.9554 = 0.9544$

(d) 1.036

(e) -0.842.

3.25 (a) $X \sim N(77, 25)$ $P(X \geq 83) = 1 - P(X<83) = 1 - \Phi\left(\frac{83-77}{5}\right) = 1 - \Phi(1.2) = 1 - 0.8849 = 0.1151$

(b) 由题得 $0.1 = 1 - \Phi\left(\frac{X-77}{5}\right)$ ⇒ $\Phi\left(\frac{X-77}{5}\right) = 0.9$ ⇒ $\frac{X-77}{5} = 1.29$ ⇒ $X = 83.45$

但求最低温度 ⇒ $77 - 6.45 = 70.46$ F.

∴ 最低 10% 为 70.46 F.

3.28. $\mu=3.2$ $\sigma=1.5$

$95\% = (\mu-2\sigma, \mu+2\sigma) = (0.2, 6.2)$

3.25 符合正态分布，理论上应计算 偏度≈0 峰度≈0.

本题中 数据分布在直线附近 也可说明 其符合正态分布.

通过 Q-Q 可以得出 斜率为标准差、在0处截距为均值