

**Study #1: How the bodies of identical twins are different from each other if one of the twins does more athletic training than the other**

**Lung Test**

**Average Results**

| <b>Twins A</b><br>(normal exercise:<br>3 hours per week) | <b>Lung Test</b><br>(in liters) | <b>Twins B</b><br>(more exercise:<br>12 hours per week) | <b>Lung Test</b><br>(in liters) |
|--|---------------------------------|---|---------------------------------|
| Average  | 3.1                             | Average   | 3.8                             |

**Full Results**

| <b>Twins A</b><br>(normal exercise:<br>3 hours per week) | <b>Lung Test</b><br>(in liters) | <b>Twins B</b><br>(more exercise:<br>12 hours per week) | <b>Lung Test</b><br>(in liters) |
|--|---------------------------------|---|---------------------------------|
| Twin A1  | 3.1                             | Twin B1   | 4.0                             |
| Twin A2  | 3.2                             | Twin B2   | 3.9                             |
| Twin A3  | 2.9                             | Twin B3   | 3.6                             |
| Twin A4  | 3.3                             | Twin B4   | 3.8                             |
| Twin A5  | 3.0                             | Twin B5   | 3.9                             |
| Twin A6  | 3.3                             | Twin B6   | 4.1                             |
| <b>Average</b>   | 3.1                             | <b>Average</b>  | 3.8                             |

**Mitochondria Test**

**Average Results**

| <b>Twins A</b><br>(normal exercise:<br>3 hours per week) | <b>Mitochondrial protein</b><br>(milligrams per sample) | <b>Twins B</b><br>(more exercise:<br>12 hours per week) | <b>Mitochondrial protein</b><br>(milligrams per sample) |
|--|---|---|---|
| Average  | .04   | Average   | .07   |

**Full Results**

| <b>Twins A</b><br>(normal exercise:<br>3 hours per week) | <b>Mitochondrial protein</b><br>(milligrams per sample) | <b>Twins B</b><br>(more exercise:<br>12 hours per week) | <b>Mitochondrial protein</b><br>(milligrams per sample) |
|--|---|---|---|
| Twin A1  | .04   | Twin B1   | .06   |
| Twin A2  | .05   | Twin B2   | .05   |
| Twin A3  | .04   | Twin B3   | .07   |
| Twin A4  | .03   | Twin B4   | .08   |
| Twin A5  | .04   | Twin B5   | .07   |
| Twin A6  | .04   | Twin B6   | .09   |
| <b>Average</b>   | .04   | <b>Average</b>  | .07   |

## Study #2: How increased athletic training changes non-athletes' bodies over time

### Heart Test

#### Average Results

| Before the study<br>(3 hours of exercise per week) | Amount of blood the heart pumps per 1 minute<br>(in liters) | After the study<br>(6 months of 12 hours of exercise per week) | Amount of blood the heart pumps per 1 minute<br>(in liters) |
|--|---|--|---|
| Average  | 19  | Average  | 22  |

#### Full Results

| Before the study<br>(3 hours of exercise per week) | Amount of blood the heart pumps per 1 minute<br>(in liters) | After the study<br>(6 months of 12 hours of exercise per week) | Amount of blood the heart pumps per 1 minute<br>(in liters) |
|--|---|--|---|
| Subject #1   | 18  | Subject #1   | 20  |
| Subject #2   | 21  | Subject #2   | 24  |
| Subject #3   | 18  | Subject #3   | 21  |
| Subject #4   | 17  | Subject #4   | 20  |
| Subject #5   | 21  | Subject #5   | 25  |
| Subject #6   | 19  | Subject #6   | 22  |
| <b>Average</b>                                     | 19  | <b>Average</b>   | 22  |

### Mitochondria Test

#### Average Results

| Before the study<br>(3 hours of exercise per week) | Mitochondrial protein<br>(milligrams per sample) | After the study<br>(6 months of 12 hours of exercise per week) | Mitochondrial protein<br>(milligrams per sample) |
|--|--|--|--|
| Average  | .04  | Average  | .06  |

#### Full Results

| Before the study<br>(3 hours of exercise per week) | Mitochondrial protein<br>(milligrams per sample) | After the study<br>(6 months of 12 hours of exercise per week) | Mitochondrial protein<br>(milligrams per sample) |
|--|--|--|--|
| Subject #1   | .04  | Subject #1   | .07  |
| Subject #2   | .06  | Subject #2   | .08  |
| Subject #3   | .04  | Subject #3   | .06  |
| Subject #4   | .05  | Subject #4   | .07  |
| Subject #5   | .05  | Subject #5   | .06  |
| Subject #6   | .03  | Subject #6   | .04  |
| <b>Average</b>                                     | .04  | <b>Average</b>   | .06  |

**Study #3: How the bodies of athletes are different from the bodies of non-athletes**

**Lung Test**

**Average Results**

| <b>Non-Athletes</b><br>(less than 4 hours<br>of exercise per<br>week) | <b>Lung test</b><br>(in liters) | <b>Athletes</b><br>(20 hours of<br>exercise per week) | <b>Lung test</b><br>(in liters) |
|---|---------------------------------|---|---------------------------------|
| Average   | 5.2                             | Average   | 5.5                             |

**Full Results**

| <b>Non-Athletes</b><br>(less than 4 hours<br>of exercise per<br>week) | <b>Lung test</b><br>(in liters) | <b>Athletes</b><br>(20 hours of<br>exercise per week) | <b>Lung test</b><br>(in liters) |
|---|---------------------------------|---|---------------------------------|
| Subject #1  | 4.3                             | Subject #1  | 4.7                             |
| Subject #2  | 4.2                             | Subject #2  | 4.4                             |
| Subject #3  | 5.7                             | Subject #3  | 5.2                             |
| Subject #4  | 5.1                             | Subject #4  | 5.9                             |
| Subject #5  | 5.5                             | Subject #5  | 5.9                             |
| Subject #6  | 5.6                             | Subject #6  | 6.2                             |
| <b>Average</b>  | 5.2                             | <b>Average</b>  | 5.5                             |

**Heart Test**

**Average Results**

| <b>Non-Athletes</b><br>(less than 4 hours<br>of exercise per<br>week) | <b>Amount of blood<br/>the heart pumps<br/>per 1 minute</b><br>(in liters) | <b>Athletes</b><br>(20 hours of<br>exercise per week) | <b>Amount of blood<br/>the heart pumps<br/>per 1 minute</b><br>(in liters) |
|---|--|---|--|
| Average   | 23   | Average   | 30   |

**Full Results**

| <b>Non-Athletes</b><br>(less than 4 hours<br>of exercise per<br>week) | <b>Amount of blood<br/>the heart pumps<br/>per 1 minute</b><br>(in liters) | <b>Athletes</b><br>(20 hours of<br>exercise per week) | <b>Amount of blood<br/>the heart pumps<br/>per 1 minute</b><br>(in liters) |
|---|--|---|--|
| Subject #1  | 23   | Subject #1  | 32   |
| Subject #2  | 22   | Subject #2  | 28   |
| Subject #3  | 25   | Subject #3  | 32   |
| Subject #4  | 20   | Subject #4  | 27   |
| Subject #5  | 24   | Subject #5  | 29   |
| Subject #6  | 24   | Subject #6  | 32   |
| <b>Average</b>  | 23   | <b>Average</b>  | 30   |