NASA Life Sciences Data Archive
Investigator name: Kenneth Baldwin
Mission (Payload): STS-58 (SLS-2)
Experiment title (ID): Effects of Zero-Gravity Exposure on Biochemical and Metabolic Properties of Skeletal Muscle (178127)
File name/Inventory ID: Preflight data folder

DEP VAR: AWT N: 11 MULTIPLE R: .380 SQUARED MULTIPLE R: .145

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	1005.382	1	1005.382	1.521	0.249
ERROR	5948.800	9	660.978		

DEP VAR: MWT N: 11 MULTIPLE R: .717 SQUARED MULTIPLE R: .514

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	2821.894	1	2821.894	9.530	0.013
ERROR	2664.833	9	296.093		

DEP VAR: MWTRAT N: 11 MULTIPLE R: .849 SQUARED MULTIPLE R: .722

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	0.039	1	0.039	23.317	0.001
ERROR	0.015	9	0.002		

DEP VAR: TPT N: 11 MULTIPLE R: .701 SQUARED MULTIPLE R: .492

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	102.594	1	102.594	8.700	0.016
ERROR	106.133	9	11.793		

DEP VAR: RT N: 11 MULTIPLE R: .690 SQUARED MULTIPLE R: .476

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	680.836	1	680.836	8.161	0.019
ERROR	750.800	9	83.422		

DEP VAR: PT N: 11 MULTIPLE R: .648 SQUARED MULTIPLE R: .420

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	765.780	1	765.780	6.517	0.031
ERROR	1057.560	9	117.507		

DEP VAR: PTNORM N: 11 MULTIPLE R: .330 SQUARED MULTIPLE R: .109

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	0.019	1	0.019	1.100	0.322
ERROR	0.154	9	0.017		

DEP VAR: MLEN N: 11 MULTIPLE R: .055 SQUARED MULTIPLE R: .003

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	0.000	1	0.000	0.027	0.873
ERROR	0.026	9	0.003		

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1 CASES DELETED DUE TO MISSING DATA.

DEP VAR: VMAX N: 10 MULTIPLE R: .791 SQUARED MULTIPLE R: .625

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	447.174	1	447.174	13.359	0.006
ERROR	267.790	8	33.474		

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1 CASES DELETED DUE TO MISSING DATA.

DEP VAR: VMAXLEN N: 10 MULTIPLE R: .700 SQUARED MULTIPLE R: .490

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	0.471	1	0.471	7.682	0.024
ERROR	0.490	8	0.061		

DEP VAR: PO N: 11 MULTIPLE R: .741 SQUARED MULTIPLE R: .550

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	16766.196	1	16766.196	10.984	0.009
ERROR	13738.225	9	1526.469		

DEP VAR: PONORM N: 11 MULTIPLE R: .531 SQUARED MULTIPLE R: .282

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	0.591	1	0.591	3.538	0.093
ERROR	1.503	9	0.167		

DEP VAR: PTNORM N: 11 MULTIPLE R: .330 SQUARED MULTIPLE R: .109

ANALYSIS OF VARIANCE

SOURCE	SUM-OF-SQUARES	DF	MEAN-SQUARE	F-RATIO	P
GROUP	0.019	1	0.019	1.100	0.322
ERROR	0.154	9	0.017		

THE FOLLOWING RESULTS ARE FOR:
GROUP = 1.000

TOTAL OBSERVATIONS: 6

	GROUP	ANUM	AWT √	MWT √	MWTRAT √
N OF CASES	6	6	6	6	6
MINIMUM	1.000	1.000	277.000	112.000	0.333
MAXIMUM	1.000	6.000	366.000	153.000	0.452
RANGE	0.000	5.000	89.000	41.000	0.118
MEAN	1.000	3.500	321.000	133.167	0.415
VARIANCE	0.000	3.500	1000.000	317.367	0.002
STANDARD DEV	0.000	1.871	31.623	17.815	0.043
STD. ERROR	0.000	0.764	12.910	7.273	0.018
SKEWNESS(G1)	0.000	0.000	-0.067	-0.036	-1.283
KURTOSIS(G2)	0.000	-1.269	-0.975	-1.793	0.374
SUM	6.000	21.000	1926.000	799.000	2.493
C.V.	0.000	0.535	0.099	0.134	0.104

	MLEN √	MLENMM	VMAX √	VMAXLEN √	PO √
N OF CASES	6	6	6	6	6
MINIMUM	1.150	29.210	54.500	1.703	158.700
MAXIMUM	1.280	32.512	72.200	2.472	257.900
RANGE	0.130	3.302	17.700	0.769	99.200
MEAN	1.227	31.157	65.600	2.114	214.867
VARIANCE	0.003	1.824	41.308	0.076	1688.635
STANDARD DEV	0.053	1.350	6.427	0.276	41.093
STD. ERROR	0.022	0.551	2.624	0.113	16.776
SKEWNESS(G1)	-0.610	-0.610	-0.852	-0.174	-0.288
KURTOSIS(G2)	-1.355	-1.355	-0.526	-1.006	-1.472
SUM	7.360	186.944	393.600	12.681	1289.200
C.V.	0.043	0.043	0.098	0.130	0.191

	PONORM √	TPT √	RT √	PT √	PTNORM √
N OF CASES	6	6	6	6	6
MINIMUM	1.824	27.000	37.000	30.900	0.355
MAXIMUM	3.138	39.000	66.000	63.700	0.740
RANGE	1.314	12.000	29.000	32.800	0.385
MEAN	2.656	32.333	53.000	50.517	0.626
VARIANCE	0.235	17.467	117.600	126.654	0.020
STANDARD DEV	0.485	4.179	10.844	11.254	0.140
STD. ERROR	0.198	1.706	4.427	4.594	0.057
SKEWNESS(G1)	-0.738	0.337	-0.130	-0.768	-1.405
KURTOSIS(G2)	-0.531	-0.706	-1.098	-0.303	0.500
SUM	15.935	194.000	318.000	303.100	3.759
C.V.	0.183	0.129	0.205	0.223	0.224

THE FOLLOWING RESULTS ARE FOR:
GROUP = 2.000

TOTAL OBSERVATIONS: 5

	GROUP	ANUM	AWT	MWT	MWTRAT
N OF CASES	5	5	5	5	5
MINIMUM	2.000	1.000	314.000	72.000	0.229
MAXIMUM	2.000	5.000	352.000	112.000	0.327
RANGE	0.000	4.000	38.000	40.000	0.098
MEAN	2.000	3.000	340.200	101.000	0.296
VARIANCE	0.000	2.500	237.200	269.500	0.001
STANDARD DEV	0.000	1.581	15.401	16.416	0.038
STD. ERROR	0.000	0.707	6.888	7.342	0.017
SKEWNESS(G1)	0.000	0.000	-1.153	-1.407	-1.282
KURTOSIS(G2)	0.000	-1.300	-0.200	0.130	0.017
SUM	10.000	15.000	1701.000	505.000	1.478
C.V.	0.000	0.527	0.045	0.163	0.129

	MLEN	MLENMM	VMAX	VMAXLEN	PO
N OF CASES	5	5	4	4	5
MINIMUM	1.170	29.718	74.000	2.365	84.200
MAXIMUM	1.290	32.766	84.500	2.819	182.200
RANGE	0.120	3.048	10.500	0.454	98.000
MEAN	1.232	31.293	79.250	2.556	136.460
VARIANCE	0.003	1.884	20.417	0.037	1323.763
STANDARD DEV	0.054	1.373	4.518	0.192	36.384
STD. ERROR	0.024	0.614	2.259	0.096	16.271
SKEWNESS(G1)	-0.218	-0.218	0.000	0.596	-0.232
KURTOSIS(G2)	-1.695	-1.695	-1.360	-0.977	-0.862
SUM	6.160	156.464	317.000	10.226	682.300
C.V.	0.044	0.044	0.057	0.075	0.267

	PONORM	TPT	RT	PT	PTNORM
N OF CASES	5	5	5	5	5
MINIMUM	1.930	24.000	27.000	20.200	0.389
MAXIMUM	2.560	29.000	44.000	45.100	0.703
RANGE	0.630	5.000	17.000	24.900	0.313
MEAN	2.190	26.200	37.200	33.760	0.543
VARIANCE	0.082	4.700	40.700	106.073	0.014
STANDARD DEV	0.286	2.168	6.380	10.299	0.118
STD. ERROR	0.128	0.970	2.853	4.606	0.053
SKEWNESS(G1)	0.417	0.375	-0.776	-0.290	0.022
KURTOSIS(G2)	-1.641	-1.592	-0.541	-1.451	-1.025
SUM	10.952	131.000	186.000	168.800	2.717
C.V.	0.130	0.083	0.171	0.305	0.217

group 1 - control SL3 group 1 – Control SL3
group 2 - flight group 2 – flight

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f vs c
f vs c

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INDEPENDENT SAMPLES T-TEST ON      AWT      GROUPED BY     GROUP
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X̄ wt of animal compared by group — mean weight of animal compared by group

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    GROUP          N      MEAN            SD
      1.000        6       321.000        31.623
      2.000        5       340.200        15.401

SEPARATE VARIANCES T =      -1.312 DF =    7.5 PROB = .228
  POOLED VARIANCES T =      -1.233 DF =      9 PROB = .249
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X̄ soleus muscle weight — mean soleus muscle weight

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INDEPENDENT SAMPLES T-TEST ON      MWT      GROUPED BY     GROUP
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X̄ wt of muscle compared by group — mean weight of muscle compared by group

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    GROUP          N      MEAN            SD
      1.000        6       133.167        17.815
      2.000        5       101.000        16.416

SEPARATE VARIANCES T =       3.113 DF =    8.9 PROB = .013
  POOLED VARIANCES T =       3.087 DF =      9 PROB = .013
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INDEPENDENT SAMPLES T-TEST ON    MWTRAT     GROUPED BY     GROUP
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X̄ muscle wt % soleus — mean muscle weight % soleus

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    GROUP          N      MEAN            SD
      1.000        6         0.415         0.043
      2.000        5         0.296         0.038

SEPARATE VARIANCES T =       4.888 DF =    8.9 PROB = .001
  POOLED VARIANCES T =       4.829 DF =      9 PROB = .001
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muscle length — muscle length

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INDEPENDENT SAMPLES T-TEST ON      MLEN     GROUPED BY     GROUP

    GROUP          N      MEAN            SD
      1.000        6 SL3 SL3  1.227        0.053
      2.000        5 flight flight 1.232   0.054

SEPARATE VARIANCES T =       -.164 DF =    8.6 PROB = .873
  POOLED VARIANCES T =       -.164 DF =      9 PROB = .873
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Time to peak tension — Time to peak tension

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INDEPENDENT SAMPLES T-TEST ON      TPT      GROUPED BY     GROUP

    GROUP          N      MEAN            SD
      1.000        6         32.333        4.179
      2.000        5         26.200        2.168

SEPARATE VARIANCES T =       3.125 DF =    7.7 PROB = .015
  POOLED VARIANCES T =       2.950 DF =      9 PROB = .016
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½ relaxation time — half relaxation time

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INDEPENDENT SAMPLES T-TEST ON       RT      GROUPED BY     GROUP

    GROUP          N      MEAN            SD
      1.000        6         53.000       10.844
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THE FOLLOWING RESULTS ARE FOR: control
GROUP = 1.000 Control (as a group) (as a group)

TOTAL OBSERVATIONS: 5

$\bar{X}$ wt of muscle (TA) mean weight of muscle (TA)

	GROUP	MWT	MFP	MFPMWT
		in control SL3 in control SL3	myofibril protein myofibril protein	
N OF CASES	5	5	5	5
MINIMUM	1.000	592.000	73.500	112.903
MAXIMUM	1.000	684.000	85.200	143.676
RANGE	0.000	92.000	11.700	30.773
MEAN	1.000	627.400	80.460	128.701
VARIANCE	0.000	1576.300	21.098	135.661
STANDARD DEV	0.000	39.703	4.593	11.647
STD. ERROR	0.000	17.756	2.054	5.209
SKEWNESS(G1)	0.000	0.484	-0.539	-0.106
KURTOSIS(G2)	0.000	-1.295	-0.888	-1.049
SUM	5.000	3137.000	402.300	643.506
C.V.	0.000	0.063	0.057	0.090

THE FOLLOWING RESULTS ARE FOR: flight
GROUP = 2.000 flight (as a group) (as a group)

TOTAL OBSERVATIONS: 5

	GROUP	mean muscle weight of flight	MWT (TA)	MFP	MFPMWT
			$\bar{X}$ muscle wt of flight (TA)		myofibril protein relative to muscle weight
N OF CASES	5		5	5	5
MINIMUM	2.000		482.000	77.700	110.946
MAXIMUM	2.000		740.000	90.400	174.066
RANGE	0.000		258.000	12.700	63.120
MEAN	2.000		639.200	82.360	131.661
VARIANCE	0.000		9309.200	27.628	628.184
STANDARD DEV	0.000		96.484	5.256	25.064
STD. ERROR	0.000		43.149	2.351	11.209
SKEWNESS(G1)	0.000		-0.865	0.618	1.130
KURTOSIS(G2)	0.000		-0.414	-0.901	-0.253
SUM	10.000		3196.000	411.800	658.305
C.V.	0.000		0.151	0.064	0.190

myofibril protein relative to muscle weight

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THE FOLLOWING RESULTS ARE FOR:
          GROUP      =        1.000

INDEPENDENT SAMPLES T-TEST ON      MFP     GROUPED BY    GROUP

INSUFFICIENT DATA FOR TEST

THE FOLLOWING RESULTS ARE FOR:
          GROUP      =        2.000

INDEPENDENT SAMPLES T-TEST ON      MFP     GROUPED BY    GROUP

INSUFFICIENT DATA FOR TEST

INDEPENDENT SAMPLES T-TEST ON      MFP     GROUPED BY    GROUP

    GROUP          N      MEAN            SD
     1.000         5       80.460         4.593
     2.000         5       82.360         5.256
 POOLED VARIANCES T =        -.609 DF =      8 PROB = .560

INDEPENDENT SAMPLES T-TEST ON   MFPMWT     GROUPED BY    GROUP

    GROUP          N      MEAN            SD
     1.000         5      128.701         11.647
     2.000         5      131.661         25.064
 POOLED VARIANCES T =        -.239 DF =      8 PROB = .817
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INDEPENDENT SAMPLES T-TEST ON PO GROUPED BY GROUP

GROUP	N	MEAN	SD
1.000	6	214.867	41.093
2.000	5	136.460	36.384

SEPARATE VARIANCES T = 3.355 DF = 8.9 PROB = .009
POOLED VARIANCES T = 3.314 DF = 9 PROB = .009

INDEPENDENT SAMPLES T-TEST ON PONORM GROUPED BY GROUP

GROUP	N	MEAN	SD
1.000	6	2.656	0.485
2.000	5	2.190	0.286

SEPARATE VARIANCES T = 1.975 DF = 8.2 PROB = .083
POOLED VARIANCES T = 1.881 DF = 9 PROB = .093

INDEPENDENT SAMPLES T-TEST ON TPT GROUPED BY GROUP

GROUP	N	MEAN	SD
1.000	6	32.333	4.179
2.000	5	26.200	2.168

SEPARATE VARIANCES T = 3.125 DF = 7.7 PROB = .015
POOLED VARIANCES T = 2.950 DF = 9 PROB = .016