

# EFFECTS OF FFM LOSS ON SYSTOLIC BLOOD PRESSURE IN DIVISION I COLLEGIATE ATHLETES

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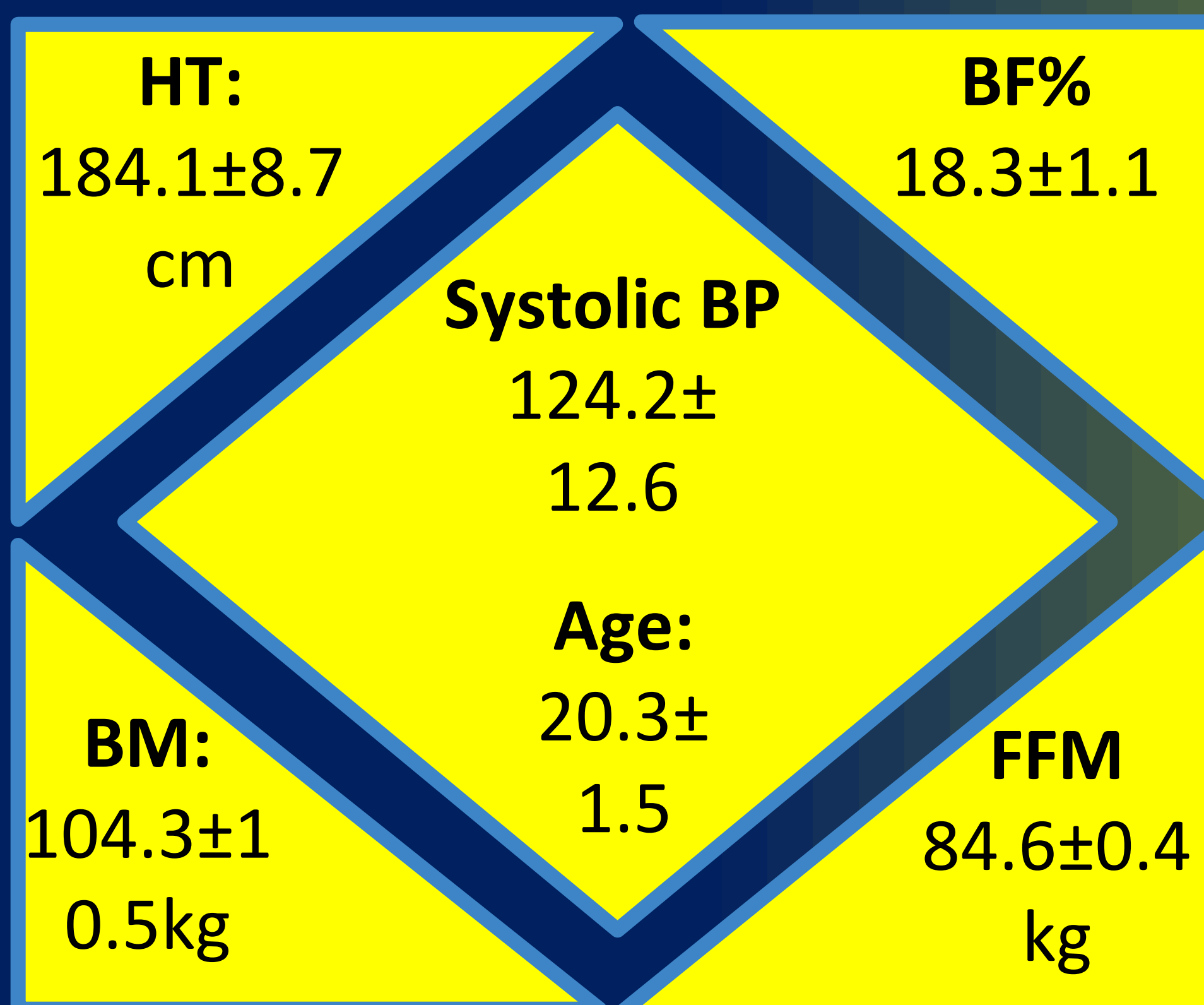
## Introduction

- Moderate/vigorous training intensity is shown to increase/maintain fat free mass (FFM) and decrease blood pressure (BP)
- Athletes who fail to maintain adequate caloric intake could be at risk for decreased FFM and hypertension (HTN)

## Hypothesis

An inverse relationship exists with FFM loss and systolic BP in Division 1 football athletes.

## PARTICIPANTS

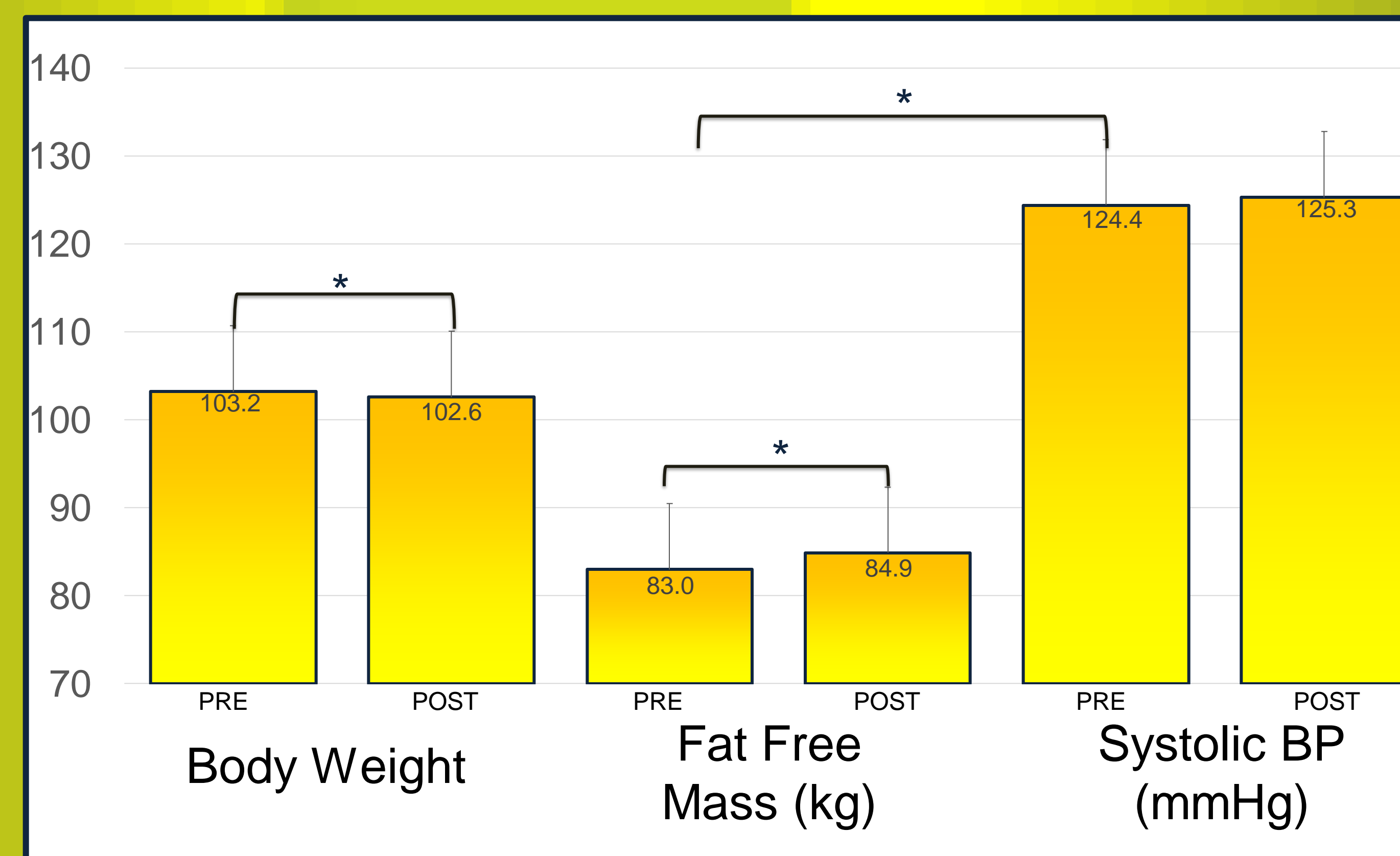


1) 53% of Football Athletes were ≥ Stage I Hypertensive During the Competitive Season

2) 33% experienced increases in blood pressure after start of Competitive Season



A significant moderate relationship ( $r=0.45$ ,  $p<0.01$ ) was found between FFM and systolic BP during PRE timepoint. 27/52 (52%) athletes were >Stage I hypertensive after preparatory whereas 30/52 (58%) were hypertensive in the competitive season ( $p > 0.05$ ).



Relationships between average Body weight, Fat Free Mass and Systolic BP PRE and POST preparatory season. Mean + SD. Brackets indicate significant difference/relationship ( $p < 0.05$ ).

## METHODS

- N=70 male football players began and N=53 completed study
- BP was measured according with ACSM guidelines and an automated BP cuff.
- Body composition was measured with multifrequency bioelectrical impedance
- Statistical analysis used Spearman's correlations and paired tests to determine FFM loss and SBP relationship.
- Time points include preparatory (April) and competitive season (October)

## RESULTS & DISCUSSION

Ww (kg) I	Ww (kg) II	BF (%) I	BF (%) II	FFM (kg) I	FFM (kg) II	Systolic (mmHg) I	Systolic (mmHg) II
104.78		17.5		86.6		135	
102.15	105.9	16.6	16.2	86.6	88.6	129	121
93.3	93.7	20	18.4	74.86	76.5	109	125
110.36	107.9	18.7	8.2	86.6	99.3	126	117
111.63	122.7	23.7	26.9	85.36	89.9	130	117
83.96		8.8		76.8		115	
119.52		18.7		97.4		143	
108.05	106.6	11.7	11.6	96.6	94.2	130	128
91.89		54.9		75.7		122	
92.57		16.8		77.3		109	
72.39	71.2	6.9	4.4	67.5	75.95	118	119
94.62	93.6	8.9	7	86.4	87.09	136	125
83.51	83.8	14.7	12.1	71.4	73.77	109	113
90.67	88.06	8.2	6.4	83.5	82.36	128	133
95.03		26.5		70		114	
84.46	85.1	14	8.9	72.8	77.45	118	123
92.35	94.1	12.1	14	81.3	80.95	120	132
79.33	77.2	16.7	14.7	66.2	65.8	101	117
88.86	81.4	5.1	3.4	84.5	78.7	128	131
72.17	69.7	13.4	13.5	62.6	60.318	107	116
109.13	106.5	18.6	16.2	89	89.2	120	115
81.47	83.5	9	9.1	76.3	75.7	113	128
88.04	94.3	12.7	13.5	76.95	81.59	110	119
97.89	95	14.6	14.8	78.9	81	148	143
87.77		23.5		67.2		134	
77.25	78.7	62.95		18.7		108	
77.34	78.8	3.9	3.2	74.5	76.2	133	138
79.61	80.9	4.3	5.1	76.4	76.9	120	114
104.51	88.5	21.8	15.3	81.9	88.8	116	121
85.82	85.4	16.3	11.1	71.95	75.9	125	128
94.2	98.2	11.9	9.4	83.1	89	114	113
75.6	80.8	12.8	11.5	66.1	71.9	114	114
83.9	88.1	15.1		151.5		109	
83.1	78.4	13.7	13.2	71.9	68.2	106	132
82.3		10.9		73.5		116	
97.3	101.6	26.9	28.1	71.3	73	137	148
90.1	93	13.3	11.5	79	80.6	151	102
86.6		10.8		77.5		120	
88.3	88.2	15.4	14.1	74.8	75.8	109	111
96.5	95.7	13.9	13.4	83.3	82.9	114	124
82.9	83.4	11.9	5.5	73.1	78.9	115	115
88.9		12.2		78.3		115	
97.4	95	19.2	16.2	78.9	79.7	119	119
	134.7		25		101.2		136
	102.9		32.4		81.9		136
111.6	113.4	19.5	20.2	90.6	90.4	150	131
80.6	81.2	16.4	19.4	67.4	65.5	119	121
83.1	81.5	10.1	8.8	74.8	74.5	143	128
102.8	101.1	14.3	10.3	88.1	90.9	143	129
140.6	140.9	33.1	30.7	94	97.8	140	141
139.2	135.8	31.7	32.3	92.2	92.2	122	116
139.7	139.7	30	21.9	97.7	109.2	119	138
135	136	28.4	28.1	96.72	97.7	130	142
124.3	125.1	23.1	21.8	95.5	98.1	131	135
161.5	154.7	39.1	36.8	98.4	98	126	132
140.9	142.7	38.4	37.4	86.8	89.6	113	126
138.7	134.3	33.3	25.2	92.5	100.7	143	146
112.6	113.5	13	10.4	98	102	113	120
125.5	129.5	22.9	27.6	96.8	94	123	121
145.4	141.8	28.8	27.6	103.6	102.9	139	129
109.6	108.8	23.9	23.9	83.4	82.55	131	147
107.5	107.4	18.7	17.5	87.5	88.9	126	130
133.9	131.4	20.6	19.3	106.3	106.9	148	122
111.9	112.9	20.4	22.3	89.1	87.8	133	127
122.4		14.1		105.2		133	
125.6		22.8		96.9		144	
144.1		37.6		89.9		145	
124	113.8	28.1	23.3	89.1	87.5	105	124
115.7		20.4		92.1		116	
125.6		32.4		84.9		120	
134		24.6		101		128	
		10.8		77.5		120	
		85.4		6		80.3	
103.8	103.2	18.9	16.8	84.0	85.1	124.7	125.5
21.7	21.9	9.3	8.8	13.6	11.1		9.8

33% of the sample lost FFM through the preparatory period ( $p = 0.01$ ).  
 12/17 (70.5%) who lost FFM were hypertensive.  
 7 players with no HTN developed HTN after season began