

# Comparing PUSH data of rugby players during the off-, pre- and in- season

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## Background

The PUSH-system is an inexpensive and reliable practical method to measure power and velocity in different exercises. The objective of this study is to measure strength, power and velocity (important for rugby players to be strong and fast in order to outcompete the opponents) and compare it with the different training phases (off-, pre- and in- season) of rugby players. A PUSH-band will be worn in the study to capture the peak and average of velocity during strength training sessions. Rugby players at the University of Pretoria have volunteered to perform the study in order to obtain the data needed.

**Aim:** The aim of this study was to explore the difference in the workout routines and methods during the off-, pre- and in-season for rugby players, and to what degree it will affect the individual players

## Methods

**Design:** Retrospective and Cohort study design

**Setting:** TuksSport ( University of Pretoria)

**Measurements:** Will be done with a PUSH 2.0 wearable accelerometer during training sessions( PUSH 2.0 accelerometer is a platform and velocity based training device).

**Participants:** 60 Rugby players of the University of Pretoria ( Varsity cup players, Cut players, 0/21 players)

## Methodology

- Warm up routine
- Place PUSH wearable accelerometer around arm
- Do training program followed by cool down
- Load data into PUSH portal platform
- Use data platform to determine performance and compare data of different seasons

## Results

The PUSH 2.0 accelerometer looked at the average force, power and velocity of players during exercise in the different seasons.

- Players had higher average force during the off-season.
- Average power was higher during the in-season.
- Average velocity was higher during the in- and pre season of training.

**Table 1.** Table containing the averages of the players in different groups and their performance in average force during each exercise.

Group	Season	Squat jump	Back Squats	Hang Power	Bench Press	Deadlifts
VC	PRE	2077,45	1901,17	1812,62	796,31	2001,90
	IN	2620,42	2064,15	3041,44	982,42	2171,25
	OFF	2628,66	2376,14	2642,66	1201,02	2156,51
CUT	PRE	2414,18	2206,09	2200,54	1028,31	2353,32
	IN	2392,48	2147,16	2934,23	1019,69	2394,24
	OFF	2609,24	2504,78	2573,56	1256,02	2826,34
YG	PRE	2077,45	1901,17	1812,62	796,31	2076,91
	IN	2119,52	1946,28	2670,87	948,98	2144,14
	OFF	2298,02	2181,71	2289,48	1093,08	

(VC- Varsity cup players, CUT- Cut players, YG- Young guns)

**Table 2.** Table containing the averages of the players in different groups and their performance in average power during each exercise.

Group	Season	Squat jump	Back Squats	Hang Power	Bench Press	Deadlifts
VC	PRE	5115,78	904,39	1176,42	412,47	757,28
	IN	6944,73	1075,72	2163,80	515,35	687,96
	OFF	3991,22	755,31	1794,64	326,92	939,35
CUT	PRE	5619,81	1052,87	1430,55	511,98	963,94
	IN	5413,78	1002,74	1965,15	440,95	709,36
	OFF	4081,01	793,98	1783,25	389,75	1070,13
YG	PRE	5115,78	904,39	1176,42	412,47	801,24
	IN	5462,32	1110,30	1873,62	461,23	689,20
	OFF	3510,45	796,74	1527,07	333,56	

(VC- Varsity cup players, CUT- Cut players, YG- Young guns)

**Table 3.** Table containing the averages of the players in different groups and their performance in average velocity during each exercise.

Group	Season	Squat jump	Back Squats	Hang Power	Bench Press	Deadlifts
VC	PRE	2,04	0,59	0,92	0,59	0,54
	IN	1,97	0,67	1,00	0,53	0,40
	OFF	1,41	0,38	0,89	0,30	0,69
CUT	PRE	1,95	0,59	0,93	0,59	0,59
	IN	1,86	0,59	0,95	0,50	0,41
	OFF	1,47	0,37	0,88	0,36	0,57
YG	PRE	2,04	0,59	0,92	0,59	0,56
	IN	2,08	0,70	1,00	0,53	0,43
	OFF	1,45	0,44	0,86	0,35	

(VC- Varsity cup players, CUT- Cut players, YG- Young guns)

## Discussion and Conclusion

It is evident that the different training methods in the three different seasons had an impact on the players. Rugby players off season consisted of harder training and the players also tried to put on some weight as it was important for them to gain a muscle. This is because no matches took place and the players pushed their bodies to the limit. The pre-season focused more on speed and the players started to get ready for the match season to start, this is where they must have been in top physical condition in order to perform on an excellent level and also avoid severe injuries. In the in-season the players played matches and their bodies experience a lot of physical contact, therefore the training were lighter in load and less physical training took place. The in season consisted of more game-plan training methods than the other seasons. The PUSH-system can be used as a performance marker to see whether players are doing their exercises correctly and not over train themselves when they are not supposed to.