

ANTHROPOMETRIC PROFILE AND SOMATOTYPE BETWEEN PLAYING POSITIONS IN MEXICAN COLLEGE AMERICAN FOOTBALL PLAYERS

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ABSTRACT

The aim of this study was to describe the anthropometric profile and somatotype of Mexican college football players and examine them according to their playing position. Ninety players participated, classifying them in the position of linemen (n=28), big skill players (n=15) and skill players (n=47). Anthropometric measurements of basic, skinfolds, perimeters and bone diameters were taken to obtain body weight, body mass index (BMI), body composition (fat, lean and muscle mass), in addition to the somatotype (endomorph, mesomorph and ectomorph). The linemen showed a higher body weight, BMI and body composition than the other positions ($p \leq .05$). In the somatotype, the three positions presented a meso-endomorphic biotype, achieving

moderate adiposity and high musculoskeletal development. Despite obtaining quite high musculature, they did not meet the professional and university level reference, furthermore, they showed problems of overweight and obesity.



KEY WORDS

anthropometry, somatotype, American football, fat mass, BMI.



INTRODUCTION

Studies have reported variation in anthropometric profiles in different sports (1) and playing positions such as football (2), handball (3) or volleyball (4). In contrast, in sports such as acrobatic gymnastics, no differences in anthropometric profiles according to categories have been found (5).

In American football, studies on physical performance profiles (6-8), body composition (9-11), anthropometric profiles and somatotype (12, 13), and have suggested that linebackers are of large proportional size and body composition, and are less agile and less fast than players in other groups such as skill and high skill players. In addition, the mesomorphic component of somatotype is predominant in college players. In addition, the tendency of linemen to be overweight and obese has been reported (14).

The relevance of anthropometric profiling studies lies in the information of body measurement values such as skinfolds, bone diameters or perimeters that can help to understand changes in body composition or shape using the somatotype technique. For example, the importance of individual skinfolds and summative skinfolds as valid surrogate measures of adiposity is nowadays emphasised (15, 16).

Body circumferences, although not often used, offer an interesting approach to skeletal muscle mass (17) and are also often used as indicators of health (18). Because anthropometric measurements are used to monitor and understand body composition and shape, there are few studies with absolute values of body circumferences, skinfolds, bone diameters in American football players (19, 20). The aim of this study was to describe the anthropometric profile and somatotype of Mexican college football players, and to examine it according to field position.



Participants

This cross-sectional study involved 90 college football players (22.4 ± 1.7 years of age) from the Authentic Tigers team of the Autonomous University of Nuevo Leon, from the National Student Major League of American Football in Mexico. The players were classified into linemen (offensive and defensive lines) (n=28).

and defensive lines) (n=28), skill players (fullbacks, tight ends and linebackers) (n=15), and skill players (wide receivers, running backs and defensive backs) (n=47), according to Miller, White, Kinley, & Congleton (2002) (21). Players were invited to participate in the study prior to the start of the season. Players were excluded if they were injured or did not complete the pre-season. Written informed consent was received prior to participation in the study. The research was approved by the board of the Ethics Committee of the Autonomous University of Nuevo León.

Procedure (Anthropometric measurements)

All measurements were performed by certified personnel according to the guidelines of the International Society for the Advancement of Kineanthropometry (ISAK) (22). Body weight was measured in kilograms (kg) with a digital scale (0-200 kg \pm 0.01 kg, SECA 813, Hamburg, Germany), and height was measured in centimetres (cm) with a stadiometer (20-205 cm \pm 5 mm; SECA 225).

Skinfolds were measured in millimetres (mm) at eight sites on the body (triceps, subscapular, biceps, iliac crest, supraspinal, abdominal, thigh and leg), using a Harpenden plicometer (0-80 \pm 0.2 mm; Harpenden Skinfold Caliper, John Bull British Indicators®, England). Perimeter measurements (cm) were taken with a metric tape (0 - 200 cm \pm 1 mm, Rosscraft, BC, Canada), taking six perimeters (relaxed arm, flexed arm, waist, hips [buttock], mid-thigh and leg). And 2 small diameters (cm) (biepicondylar diameter of the humerus and femur) were taken with the Tommy small branch anthropometer (Rosscraft).

Briefly, all measurements were identified by anatomical reference points, taken on the right side of the body and in duplicate, the average being taken as the final value. The technical error of measurement was followed in accordance with ISAK standards and the participants were called in first thing in the morning with a fasting period of

no more than 4 hours and with appropriate clothing to be able to take the necessary measurements.

Anthropometric profile (Anthropometric indicators and body composition)

The sum of 6 skinfolds ($\Sigma 6$) (triceps, subscapular, supraspinal, abdominal, anterior thigh and medial leg) and the sum of the 8 skinfolds ($\Sigma 8$) (biceps, iliac crest + $\Sigma 6$) were calculated. BMI was calculated with the value of weight in kilograms over height in metres squared (kg/m^2), and then using the ranges established by the World Health Organization (WHO) (23), where it categorises underweight (< 18.5), normal weight (18.5 - 24.9), overweight (25 - 29.9), obesity type I (30 - 34.9), obesity type II (35 - 39.9) and obesity and type III (> 40).

In body composition, body fat, lean mass, and muscle mass were obtained. First, body density was estimated in grams per cubic centimetre (g/cm^3) with an equation for the general population such as that of Durnin & Womersley (1974) (24), and with two equations for the athlete population, namely those of Withers, Craig, Bourdon, & Norton (1987) (25) and Yuhasz (1974) (26). After obtaining body density, the equation of Siri, Brozek, & Henschel (1961) (27) was used to determine fat percentage, fat mass in kg, lean mass percentage and lean mass in kg. Muscle mass was determined in percentage and kg with the equation of Lee et al. (2000) (17).

Somatotype

The somatotype method of Carter, Carter, & Heath (1990) (28) was used, requesting two basic measurements (body weight and height), four skinfolds (triceps, subscapular, supraspinal and medial leg), two perimeters (flexed arm and leg) and two diameters (bicipital humerus and femur), in order to obtain the three different biotypes (endomorph, mesomorph and ectomorph). The scale of Carter et al. (1990) was also used, defining the values of endomorphy as low (range 1-3), moderate (range 3-5), high (range 5-7) and extremely high (range 7-9) relative adiposity, and mesomorphy as low (range 1-3) relative musculoskeletal development, moderate (range 3-5), high (range 5-7) and extremely high (range 7-9), and the ectomorphy value as low (range 1-3), moderate (range 3-5), high (range 5-7) and extremely high (range 7-9) relative linearity.

Statistical analysis

Data were analysed in SPSS (Version 25). The normality of the data distribution was tested using the Kolmogorov-Smirnov test. Descriptive statistics were expressed as

mean and standard deviation. Differences between anthropometric values (anthropometric measurements, anthropometric indicators and body composition) and somatotype (endomorphism, mesomorphism and ectomorphism) of the different position groups (linemen, high skill players and skill players) were identified by analysis of variance (ANOVA) with Tukey's post hoc tests. Statistical significance was established at $p \leq .05$.

RESULTS

From the results of the basic measurements by position, the following data were found (Table 1): Linemen are heavier than high skill ($p = .000$) and skill ($p = .000$), and high skill are heavier than skill ($p = .000$). In height, linemen are taller than those of high ability ($p = .018$) and skill ($p = .000$), and those of high ability are taller than those of skill ($p = .233$). And in BMI, linemen had higher BMIs than high ability ($p = .000$) and ability ($p = .000$), and high ability had higher BMIs than ability ($p = .002$). All three positions assessed were found to have a BMI of overweight and obesity.

Table 1. Statistical analysis of basic player measurements by position.

Basic measurements	Total players (n= 90)	Linemen(n=28)	High-Skill Players (n=15)	Skill Players (n=47)
Age (years)	22.42 ± 1.71	22.18 ± 1.64	22.18 ± 2.09	22.64 ± 1.63
Body weight (kg)	93.98 ± 18.81	116.18 ± 14.13 ^{a,b}	93.67 ± 6.13 ^c	80.86 ± 8.96
Size (cm)	179.06 ± 6.34	183.80 ± 3.97 ^{a,b}	178.94 ± 4.54	176.28 ± 6.38
BMI (kg/m ²)	29.17 ± 4.91	34.49 ± 4.88 ^{a,b}	29.24 ± 1.42 ^c	25.98 ± 2.13

Note. n: number; kg: kilograms; cm: centimetres; BMI: body mass index; kg/m²: kilograms per metre squared.

^a $p \leq .05$ linemen vs high skill players.

^b $p \leq .05$ linemen vs skill players.

^c $p \leq .05$ high-skill players vs skill players.

In skinfolds, linemen yielded higher values than high skill (triceps [$p = .002$], subscapular [$p = .001$], biceps [$p = .027$], iliac crest [$p = .035$], supraspinal [$p = .000$], abdominal [$p = .227$], thigh [$p = .040$], and leg [$p = .001$]), and skill (triceps [$p = .000$], subscapular [$p = .000$], biceps [$p = .000$], iliac crest [$p = .000$], supraspinal [$p = .000$], abdominal [$p = .000$], thigh [$p = .000$] and leg [$p = .000$]), and high skill showed higher values than skill (triceps [$p = .226$], subscapular [$p = .006$], biceps [$p = .355$], iliac crest [$p = .007$], supraspinal [$p = .022$], abdominal [$p = .002$], thigh [$p = .272$] and leg [$p = .247$]) (Table 2) (Table 2). In the sum of 6 and 8 folds, linemen showed higher value than those of high ability ($\Sigma 6$ [$p = .002$] and $\Sigma 8$ [$p = .003$]) and ability ($\Sigma 6$ [$p = .000$] and $\Sigma 8$ [$p = .000$]), and those of high ability showed higher value than those of ability ($\Sigma 6$ [$p = .015$] and $\Sigma 8$ [$p = .013$]) (Table 2).

Table 2. Statistical analysis of players' skinfolds by position.

Skinfolds (mm)	Total Players (n= 90)	Linemen (n=28)	High Skill Players (n=15)	Skill Players (n=47)
Triceps	12.14 ± 5.80	17.02 ± 6.98 ^{a,b}	11.71 ± 3.95	9.36 ± 3.05
Subscapular	16.33 ± 7.39	22.52 ± 8.09 ^{a,b}	16.91 ± 3.44 ^c	11.87 ± 3.43
Biceps	6.30 ± 3.38	8.67 ± 4.68 ^{a,b}	6.16 ± 2.07	4.94 ± 1.64
Iliac crest	21.84 ± 10.10	30.19 ± 11.45 ^{a,b}	23.69 ± 5.98 ^c	16.27 ± 5.86
Supraspinal	14.95 ± 8.58	23.33 ± 9.80 ^{a,b}	14.98 ± 5.05 ^c	9.94 ± 3.18
Abdominal	24.19 ± 9.39	31.04 ± 9.70 ^b	27.22 ± 5.63 ^c	19.15 ± 6.95
Thigh	13.31 ± 5.80	17.33 ± 7.36 ^{a,b}	13.28 ± 3.34	10.97 ± 3.77
Leg	10.78 ± 5.73	15.78 ± 6.94 ^{a,b}	10.19 ± 2.92	7.99 ± 3.06
Sum of 6 skinfolds	91.72 ± 39.31	128.03 ± 44.32 ^{a,b}	94.31 ± 17.91 ^c	69.26 ± 20.47
Sum of 8 skinfolds	119.8 ± 51.66	166.91 ± 58.66 ^{a,b}	124.18 ± 24.7 ^c	90.48 ± 26.88

Note. n: number; mm: milimetres

^a p ≤ .05 linemen vs high skill players.

^b p ≤ .05 linemen vs skill players.

^c p ≤ .05 high-skill players vs skill players.

In the measurements of perimeters and diameters (Table 3), linemen obtained higher values than high-skill linemen (relaxed arm [p= .000], flexed arm [p= .018], waist [p= .000], hips [p= .000], mid-thigh [p= .000], leg [p= .000], humerus diameter [p= .144] and femur diameter [p= .012]) and skill (relaxed arm [p= .000], flexed arm [p= .000], waist [p= .000], hips [p= .000], mid-thigh [p= .000], leg [p= .000], humerus diameter [p= .000] and femur diameter [p= .000]), and those of high ability had higher values than those of ability (relaxed arm [p= .000], flexed arm [p= .000], flexed arm [p= .000], flexed arm [p= .000], waist [p= .002], hips [p= .001], mid-thigh [p= .001], leg [p= .039], humerus diameter [p= .494] and femur diameter [p= .014]).

Table 3. Statistical analysis of players' perimeters and diameters by position.

Perimeters and diameters (cm)	Total Players (n= 90)	Linemen (n=28)	High Skill Players (n=15)	Skill Players (n=47)
Triceps	36.98 ± 3.44	40.61 ± 2.81 ^{a,b}	37.49 ± 0.92 ^c	34.66 ± 2.10
Subscapular	38.88 ± 3.24	41.91 ± 2.84 ^{a,b}	39.89 ± 1.41 ^c	36.76 ± 2.10
Biceps	90.37 ± 11.27	102.35 ± 11.88 ^{a,b}	90.84 ± 3.58 ^c	83.09 ± 4.20
Iliac crest	105.20 ± 9.50	116.20 ± 6.46 ^{a,b}	104.94 ± 3.74 ^c	98.72 ± 5.40
Supraspinal	59.90 ± 5.38	65.61 ± 4.09 ^{a,b}	60.27 ± 2.01 ^c	56.39 ± 3.52
Abdominal	39.74 ± 3.44	43.11 ± 3.36 ^{a,b}	39.63 ± 1.97 ^c	37.77 ± 2.04
Thigh	7.13 ± 0.57	7.45 ± 0.55 ^b	7.12 ± 0.49	6.94 ± 0.54
Leg	10.05 ± 0.75	10.70 ± 0.64 ^{a,b}	10.14 ± 0.40 ^c	9.63 ± 0.60

Note. n: number; cm: centimetres

^a p ≤ .05 linemen vs high skill players.

^b p ≤ .05 linemen vs skill players.

^c p ≤ .05 high-skill players vs skill players.

In body composition (Table 4), several equations were used to obtain the fat mass, lean mass and muscle mass compartments, in which we found that linemen yielded

higher fat percentages than those of high ability (Durnin & Womersley [$p = .030$], Withers [$p = .002$], Yuhasz [$p = .002$]) and ability (Durnin & Womersley [$p = .000$], Withers [$p = .000$], Yuhasz [$p = .000$]), and high ability linemen were higher than ability linemen (Durnin & Womersley [$p = .001$], Withers [$p = .024$], Yuhasz [$p = .015$]). In fat mass in kg linemen yielded higher than high ability (Durnin & Womersley [$p = .000$], Withers [$p = .000$], Yuhasz [$p = .000$]) and ability (Durnin & Womersley [$p = .000$], Withers [$p = .000$], Yuhasz [$p = .000$]), and those of high ability scored higher than those of ability (Durnin & Womersley [$p = .002$], Withers [$p = .041$], Yuhasz [$p = .021$]).

In lean mass in kg linemen scored higher than high ability (Durnin & Womersley [$p = .000$], Withers [$p = .000$], Yuhasz [$p = .000$]) and ability (Durnin & Womersley [$p = .000$], Withers [$p = .000$], Yuhasz [$p = .000$], Yuhasz [$p = .000$]). $.000$, Yuhasz [$p = .000$]), and high ability scored higher than ability (Durnin & Womersley [$p = .004$], Withers [$p = .002$], Yuhasz [$p = .000$]). The opposite was true for the lean mass percentage results, which showed that linemen had lower percentages than those with high skill (Durnin & Womersley [$p = .030$], Withers [$p = .002$], Yuhasz [$p = .002$], Yuhasz [$p = .000$]). $.002$, Yuhasz [$p = .002$]) and skill (Durnin & Womersley [$p = .000$], Withers [$p = .000$], Yuhasz [$p = .000$]), and high-skill linemen were lower than skill linemen (Durnin & Womersley [$p = .001$], Withers [$p = .024$], Yuhasz [$p = .015$]).

In the muscle mass compartment, in kg, linemen scored higher than high skill ($p = .000$) and skill ($p = .000$), and high skill scored higher than skill ($p = .001$). The opposite was true for muscle mass percentage, with linemen scoring lower than high ability ($p = .000$) and skill ($p = .000$), and high ability scoring lower than skill ($p = .028$).

Table 4. Statistical analysis of body composition with anthropometric equations of players by position.

BODY COMPOSITION	Total Players (n= 90)	Linemen (n=28)	High Skill Players (n=15)	Skill Players (n=47)
<i>Durnin & Womersley (1974)</i>				
BD (g/cm ³)	1.048 ± 0.01	1.037 ± 0.012 a,b	1.045 ± 0.006 c	1.056 ± 0.009
Fat (%)	22.01 ± 6.03	27.25 ± 5.72 a,b	23.42 ± 2.84 c	18.44 ± 4.30
Fat mass (kg)	21.60 ± 10.01	32.28 ± 9.84 a,b	22.00 ± 3.51 c	15.10 ± 4.53
Lean mass (%)	77.98 ± 6.03	72.74 ± 5.72 a,b	76.57 ± 2.84 c	81.55 ± 4.30
Lean mass (kg)	72.38 ± 10.03	83.89 ± 6.35 a,b	71.66 ± 4.42 c	65.76 ± 6.28
<i>Withers et al., (1987)</i>				
BD (g/cm ³)	1.059 ± 0.01			1.069 ± 0.008
Fat (%)	17.28 ± 7.59	1.044 ± 0.019 a,b	1.058 ± 0.007 c	13.02 ± 3.79
Fat mass (kg)	17.41 ± 11.40	24.24 ± 8.79 a,b	17.61 ± 3.51 c	10.71 ± 3.84
Lean mass (%)	82.71 ± 7.59	29.10 ± 13.22 a,b	16.60 ± 4.09 c	86.97 ± 3.79
Lean mass (kg)	76.57 ± 9.93	75.75 ± 8.79 a,b	82.38 ± 3.51 c	70.15 ± 6.64
<i>Yuhasz (1974)</i>				
BD (g/cm ³)	12.21 ± 4.12			9.85 ± 2.14
Fat (%)	12.12 ± 6.65			8.07 ± 2.34
Fat mass (kg)	87.78 ± 4.12	16.02 ± 4.65 a,b	12.48 ± 1.88 c	90.14 ± 2.14
Lean mass (%)	81.86 ± 12.97	19.12 ± 7.37 a,b	11.75 ± 2.32 c	72.79 ± 7.27
<i>Lee et al., (2000)</i>				
Muscle (%)	42.62 ± 4.59	83.97 ± 4.65 a,b	87.51 ± 1.88 c	45.26 ± 2.97
Muscle Mass (kg)	39.33 ± 4.52	97.06 ± 8.40 a,b	81.91 ± 4.67 c	36.45 ± 3.27
		38.18 ± 4.19 a,b	42.64 ± 2.86 c	
		43.91 ± 3.27 a,b	39.83 ± 2.03 c	

Note. n: number; bd: body density; g/cm³: grams over cubic centimetres; %: percentage kg: kilograms.

^a p ≤ .05 linemen vs high skill players.

^b p ≤ .05 linemen vs skill players.

^c p ≤ .05 high-skill players vs skill players

In the somatotype biotype (Table 5), players in all three positions had a meso-endomorphic biotype. In the values for each biotype, it was found that linemen had lower endomorphic values than those with high skill (p= .424) and skill (p= .767), and those with high skill had higher values than those with skill (p= .706). In mesomorphy the linemen scored lower than those of high ability (p= .009) and ability (p= .018), and those of high ability higher than those of ability (p= .577). In ectomorphy, linemen

showed a higher value than high ability ($p = .004$) and ability ($p = .042$), and high ability lower than ability ($p = .240$).

Table 5. Statistical analysis of the somatotype of the players by position.

Biotype	Total Players (n= 90)	Linemen (n=28)	High Skill Players (n=15)	Skill Players (n=47)
Endomorphy	4.02 ± 1.65	3.76 ± 1.82	4.43 ± 1.42	4.04 ± 1.61
Mesomorphy	6.47 ± 1.41	5.79 ± 1.50 ^{a,b}	7.08 ± 1.41	6.68 ± 1.21
Ectomorphy	0.97 ± 0.77	1.32 ± 0.79 ^{a,b}	0.54 ± 0.31	0.90 ± 0.78

Note. n: number.

^a $p \leq .05$ linemen vs high skill players.

^b $p \leq .05$ linemen vs skill players.

^c $p \leq .05$ high-skill players vs skill players

DISCUSSION

The practice of American football requires a large body physique, i.e. a sufficiently large body proportionality, as it is a very demanding discipline with a high physical impact (29, 30). Therefore, the aim of this study was to describe the anthropometric profile and somatotype of Mexican university American football players, and to examine it according to the field position. Most of the studies found on the body composition and physical profile of the American football player usually use dual X-ray densitometry (DEXA), air displacement plethysmography (BOD POD) or electrical impedance (electrical scales) as measurement methods. In our case, the anthropometry method was used, with measurements such as skinfolds, perimeters and diameters (22).

The results of the basic measurements of this study show that the height of our players is between 179 and 183 cm, values that are much lower than those of our competitors. values well below if we compare them with players at professional level such as the National Football League (NFL) (7, 8, 14, 31-34) and at university level such as the National Collegiate Athletic Association (NCAA) (6, 10, 35), which show heights above 190 cm.

In terms of body weight and BMI, we observed that linemen are heavier than the other positions, normal results in this position because their function is to defend and tackle the opponent, which is why their build is high, as shown in some studies (7, 8, 34). When compared to other studies, we observed that professional linemen (7, 8, 14, 31, 33, 34, 36) and university linemen (10, 35, 37), are usually heavier and have a higher BMI than our linemen, even having a BMI of type III obesity, only being above two

studies with university players (37, 38), in which one study was longitudinal, exceeding our results prior to the competition (37).

Skill players tend to be the least heavy, here we can find runners, which, the lower their body weight, the higher their speed (21). If we look at other studies (7, 10, 14, 31, 33, 34, 36), we find that skill players and runners obtained a higher weight and BMI than our data, only the study like Vitale et al. (2016) (8) which were with Italian players, achieved a lower weight and BMI. We observed that most of the positions in professional and collegiate level studies, tend to be players with high body weight and therefore a BMI with a tendency to overweight those of great skill and ability, and obesity type I, II and III linemen (39).

In this study we obtained fat mass and lean mass using three anthropometric equations, that of Durnin & Womersley which overestimated fat mass because it was an equation for the general population, and that of Withers and Yuhasz which underestimated fat mass because it was an equation specific to athletes. The linemen, being heavier and with a higher BMI, had a higher percentage fat and lean mass (kg) than those with high skill and ability. When compared with some studies which used anthropometry as a measurement method and with equations by Durnin & Womersley, and Jackson & Pollock (37, 40), they achieved a lower fat percentage and a higher amount of lean mass (kg) than our data for the three positions evaluated.

Other studies (8, 38) that used electrical impedance to obtain fat mass obtained higher fat percentage than our results with the Withers and Yuhasz equations, but very similar with the Durnin & Womersley equation. Some other studies used DEXA as a measurement method (10, 14, 31, 41, 42), and found very similar data for fat percentage and fat mass. very similar data in fat percentage and lean mass (kg) as our data at the three positions with the Durnin & Womersley equation, but well above our data with the Withers and Yuhasz equations.

The Bod Pod is another measurement method to obtain fat percentage and lean mass, some studies with professional (14, 32, 36) and college (6) level players used this method, which yielded a lower fat percentage and a higher lean mass (kg) compared to our results with the Durnin & Womersley equation, but very similar with the Withers and Yuhasz equation.

Muscle mass is another compartment that was evaluated in this research, in which the linemen, being the ones with the highest amount of body weight, showed a higher

amount than the other positions. Most of the studies obtained the lean mass compartment, as the equipment used to measure body composition does not usually show this compartment, which is muscle mass.

In somatotype we have found few studies that perform this type of analysis. In our case, our players of the three positions present a meso-endomorphic biotype, values very similar to one of the few studies that have used the somatotype method, which was the research of Carter (1968) (43) with university players, which was divided into 6 positions, and in all of them they obtained a meso-endomorphic biotype. From the values obtained in the three biotypes (endomorph, mesomorph and ectomorph) of the scale of Carter et al. (1990) (28), we find linemen, high ability and skill linemen in their endomorph value defined as moderate relative adiposity, in mesomorph linemen and skill linemen defined as high relative musculoskeletal development, and high ability linemen as extremely high relative musculoskeletal development, and in ectomorph defined as low relative linearity for the three positions.

It must be considered that depending on the measurement method to be used to obtain the body composition or morphological profile, the make and model of the equipment, and even the type of anthropometric equation, must be taken into account. Many times we will get different results, either fat mass, lean mass, which must be taken into account when discussing the results.



CONCLUSIONS

The players in this study were well below NFL and NCAA level height, although with a lower body weight and BMI, However, the BMI of our players showed a problem of overweight and obesity. Body composition was differentiated by field position, with linemen showing a higher fat percentage and a higher lean mass than the other positions. Although our players had a high somatotype and extremely high mesomorphic (musculoskeletal) somatotype, they did not have the same amount of lean mass as professional players.

There are few studies that have carried out an anthropometric profile in professional and university level American football players, hence the need to carry out more studies using the anthropometric method, to obtain an ideal profile and somatotype in Mexican players at university and professional level.



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