Álvarez Medina, J.; Murillo Lorente, V. y García Felipe, A. (2018). Influencia del cambio de reglamento sobre los goles realizados en fútbol sala / Influence of Change of Regulation on the Goals Achieved in Futsal. Revista Internacional de Medicina y Ciencias de la Actividad Física y el Deporte vol. 18 (70) pp. 213-226
Http://cdeporte.rediris.es/revista/revista70/artinfluencia871.htm
DOI: http://dx.doi.org/10.15366/rimcafd2018.70.002

ORIGINAL

INFLUENCE OF CHANGE OF REGULATION ON THE GOALS ACHIEVED IN FUTSAL

INFLUENCIA DEL CAMBIO DE REGLAMENTO SOBRE LOS GOLES REALIZADOS EN FÚTBOL SALA

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Código UNESCO/UNESCO code: 5899 Otras especialidades pedagógicas (Educación Física y Deporte) / Other pedagogical specialties (Physical Education and Sports)
Clasificación Consejo de Europa/Council of Europe classification: 4 Educación Física y deporte comparado /
Physical Education and sport compared.

Recibido 18 de agosto de 2015 **Received** August 18, 2015
Aceptado 29 de septiembre de 2015 **Accepted** September 29, 2015

ABSTRACT

This article analyses the hypothesis that the changes introduced in the regulation of futsal modify the inner logic of the game, what turns into a reduction of total goals and a significant variation in the form of execution. Therefore, it is set out as aim of study to analyze the goals and the way to achieve them in a previous season and in one subsequent to the change of regulation in order to establish quantitatively how the 2006 rules change has affected the game. Totally, 3126 goals were analyzed, scored in 442 matches, distributed in 1771 goals in 232 matches in season 2002-2003 and 1355 goals in 210 matches in season 2103-2014. The method used in this study was observational methodology. For the observational process, it has been used the observational software Lince vl.2.1. It has been carried out using the IBM SPSS 19.0.0 program. The results show a statistically significant reduction in the

number of goals from one season to another. In season 2002-2003, 1927 goals were achieved with an average by team of 120.38±28.58, by 1355 goals in season 2013-2014 of 90.40±27.72.

KEYWORDS: futsal, observational analysis, goals, changing regulation

RESUMEN

Este artículo analiza la hipótesis de que los cambios introducidos en la normativa del fútbol sala modifican su lógica interna disminuyendo los goles totales y modificando su forma de ejecución. El objetivo de estudio es analizar los goles y manera de realizarlos en una temporada anterior y posterior al cambio de reglamentación para establecer cuantitativamente cómo el cambio de reglas del 2.006 afecta al juego. Se analizaron 3.126 goles en 442 partidos, 1.771 goles en 232 partidos en la temporada 2.002-2.003 y 1.355 goles en 210 partidos en la temporada 2.013-2.014. El método utilizado fue la metodología observacional, se utilizó el programa Lince vl.2.1. Los resultados muestran una reducción estadísticamente significativa en el número de goles de una temporada a otra. En la temporada 2.002-2.003 se lograron 1.927 goles con un promedio por equipo de 120,38 ± 28,58, y en la temporada 2.013-2.014 1.355 goles con un promedio de 90,40 ± 27,72.

PALABRAS CLAVE: futbol sala, análisis observacional, goles, cambio de normativa.

1. INTRODUCTION

The evolution in the world of the sport-entertainment, in the last years, has been great. The regulation undergoes changes in order to make the game more attractive for the spectator and adjust it to, generally, television needs (Cachón, Valdivia, Lara, Zagalaz & Berdejo, 2014). These modifications often seek to encourage a fast and dynamic game and the more achievement of points or goals. These changes modify the inner logic of the game, since the regulation establishes the formal structure, what is allow and not and imposes its own character to the sport.

Futsal (FS) has not been a different case. In the game regulations of FS of the Spanish Federation of Football (RFEF, 2007) we can read '*for many years the International Federation of Associated Football (FIFA) has allowed FS to be played with different game regulations, so as to encourage its development and not to limit its evolution*'. This fact made that its practice was ruled by different regulations depending on where it was played, both in national and international competitions. With the passing of time, FIFA decides we have reached such a level of development that the most advisable for its future is to unify it permanently and to contribute in this way to play under unique Game Regulations. In season 2006-2007, all member associations, started their competitions under the FIFA FS Game Regulations.

From this changing regulation onwards many opinions have been listened on that subject. The only study that presents this change is the one carried out by Cachón, Rodrigo, Linares & Zagalaz (2012) titled 'Qualitative analysis of the change in futsal rules (2006) in Spain', based on the opinion of players, coaches and managers by means of a questionnaire made during the 20th Edition of the National League Championship indoor soccer cup that took place in Granada, Spain, in 2009. Their conclusions are that FS spectacle has been adversely affected, especially in relation to brightness (technically and tactically), reduction of the number of goals and game speed.

According to De Bortoli A, De Bortoli R, Márquez & De Castilla (2001), the use rate is the best predictor of performance in FS, that is to say, the finalization of the offensive sequences with success determines the final result in this sport (Lago, Cancela, López, Fernández & Veiga 2006). To demonstrate quantitatively the influence of the modification of the regulation in FS is necessary to know how many goals are done and how they are achieved. There are very few studies analyzing the goal, except the one carried out by Álvarez, Puente, Manero & Manonelles (2004) 'Analysis of the offensive actions ending goal in the Spanish Professional Futsal League', the rest only analyze the finals of short tournaments (Lapresa, Álvarez, Arana, Garzón & Caballero, 2013; Martin 2009; Alves 2010) whose data can be taken as a reference but taking into account that the form and style of the game is not the same in a short than in a long tournament.

In this study is established the hypothesis that the changes introduced in the regulation modify the inner logic of the game, what turns into a reduction of total goals and a significant variation in the form of execution. Therefore, it is set out as aim of study to analyze the goals and the way to achieve them in a previous season and in one subsequent to the change of regulation in order to establish quantitatively how the 2006 rules change has affected the game.

2. METHODS

2.1. Sample

This is an observational, descriptive and comparative study, in which the goals of season 2013-2014 of the Spanish National Futsal League (LNFS) at its maximum category, First Division, have been analyzed, once the new regulation was introduced, and the goals of season 2002-2003, playing with the old regulation, recorded and coded by Álvarez et al., (2004).

Totally, 3126 goals were analyzed, scored in 442 matches (table 1), distributed in 1771 goals in 232 matches in season 2002-2003 and 1355 goals in 210 matches in season 2103-2014. Moreover, all goals for the last thirteen seasons of the LNFS, through the LNFS final classifications, have been retrospectively collected in order to establish quantitatively their own evolution.

Table 1. Number of teams, games and goals of the 2002-2003 and 2013-2014 seasons.

Season	Teams in the league	Total teams	Analyzed matches	Total goals	Analyzed goals
2002-2003	16	240	232	1.927	1.771
2013-2014	15	210	210	1.355	1.355*
Totals	31	450	442	3.282	3.126

*(*not been able to categorize 46 goals in the variables "defined area", "striking surface", "number of passes" and "number of players")*

Table 2. Changing regulation in the most important rules of the game

Old regulation	**New regulation**
GOALKEEPER KICK	
- The ball cannot pass the midfield line	- The ball can pass the midfield line
THROW IN	
- Carried out with the hand, direct goal is not valid	- Carried out with the foot, direct goal is not valid - The defense players are placed 5 meters away from the ball
CORNER KICK	
- Carried out with the hand - Direct goal is not valid - If the ball touches the goalkeeper and enters, it is a corner kick	- Carried out with the foot - Direct goal is valid if it is scored in the opponent goal - If the ball touches the goalkeeper and enters, the goal is valid - The opponents are placed 5 meters away

2.2. Method

The method used in this study was observational methodology (Bakeman & Gottman, 1987). The observational design is, according to Anguera (2013), follow-up (the dispute of all matches of the season), nomothetic (because the study focuses on the number if times that a behavior is repeated, in this particular case, the goal), and multidimensional (as it takes into account proxemic conducts as well as gestural ones). The level of participation is non-participative observation, given that the observer does not interact with the observed players and the degree of perceptivity is complete, direct observation.

To the analysis of the goals of the season previous to the changing regulation, it was used the study 'Analysis of the offensive actions ending goal in the Spanish Professional Futsal League' where the same methodology was used (Álvarez et al., 2004).

2.3. Observational tool

For the observational process, it has been used the observational software Lince vl.2.1. To contribute to data reduction and facilitate its coding, a categorization was carried out, assigning nominal values to the different items of the observation form. All the recordings were obtained by means of the

internet thanks to the videos provided by the LNF and were subsequently coded.

2.4. Consistency between observations

In order to guarantee the reliability and validity of the study, a period of observational training of the researcher was carried out, where all the matches of a day were randomly selected for its analysis; two days later, the same process was repeated achieving a confidence rate of 0.91, higher than the one set by Anguera (2013) of 0.85, through its formula (lower number/upper number)*100. In the middle of the analysis another test of reliability obtaining a rate of 0.96 was made.

This observational training, understood as the first pilot study of the research, supposed an informational feedback about the variables which allowed carry out modifications regarding to the categorization made by Álvarez et al. (2004), due principally to the changing regulation. New categories inside the variable 'type of play' appear, as it can be seen in table 3:

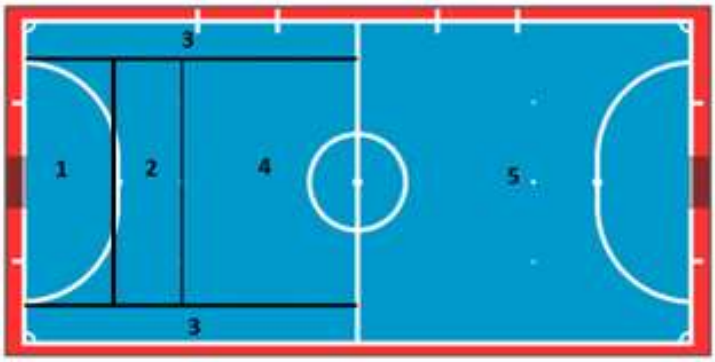
- Superiority (SU) and inferiority (IN); owing to the new rule in which one expelled player leaves his team with one player less for two minutes.

- Goalkeeper (GK); owing to the new rule in which the goalkeeper kick can cross the whole pitch.

Table 3. Variable definitions

Nº	Variable	Category
1	**Type of play**	Static attack: *the play or attack passes with an structured and fixed defense*; Counter-attack: *action started with a quick forward move towards the opposing goal without an structured rival defense*; Rebound/clearance: *situation where the ball is free after a shot, a pass or a loss*; Pressing overcoming: *tactic movement made by a team in possession of the ball when the rival is exerting pressure in its own area*; Steal: *recovery of the possession by the defense team without the ball leaves the pitch*; 2nd post: *realization of a goal from the furthest post form where the sequence comes*; Goalkeeper-player: *possibility of attack of a futsal team replacing the goalkeeper by a field player, having the superiority in 5x4 offensive sequences*; Superiority: *greater number of field players than the opponent by the expulsion of an opposing player;* Inferiority: *smaller number of field players than the opponent by the use of the goalkeeper-player or an own expulsion*; Goalkeeper: *goal of the goalkeeper from his own area*; Own goal: *a player of the defending team scores an own goal*
2	**Type of strategy** (goal is achieved from set pieces)	Corner kick: *the ball goes out by the baseline, touched by a player defending this goal*; Throw in*: the ball goes out by the sideline*; Foul with barrier: *shot due to a breach of the rules made by the opponent team. This foul allows to place a line of men opposite the ball to cover the goal from the 5m line on*; Double penalty: *shot without barrier from the 10m position as a punishment for a team with more than five fouls in this part of the game*; Penalty: *shot from 6meters without barrier, after a foul has been committed in the penalty area by the team defending this area*
3	**Definition zone** (where the kick is made)	Zone 1: goalkeeper area; Zone 2: from 6m line to double penalty point, that is to say, 10m line; Zone 3: sidelines of the opponent field; Zone 4: from 10m line to midfield; Zone : own field *(figure 1)*
4	**Contact surface**	Instep, inside edge, outside edge, toe, head, others: heel, knee, chest…
5	**Number of passes** (without any player of the other team getting in contact with the ball)	1-2 passes, 3-4 passes, 5-6 passes, +6 passes.
6	**Players involved** (get in contact with the ball in the offensive sequence)	1 player, 2 players, 3 players, 4 players, 5 players.

Figure 1. Definition zones



Zone 1 (Z1): goalkeeper area; Zone 2 (Z2): from 6m line to double penalty point, that is to say, 10m line; Zone 3 (Z3): sidelines of the opponent field; Zone 4 (Z4): from 10m line to midfield; Zone 5 (Z5): own field.

2.5. Data analysis

It has been carried out using the IBM SPSS 19.0.0 program (University of Zaragoza license). Excel spreadsheets were used to data collection. The results of those findings with statistical meaning or a clear interest to the concerning study, are presented by means of tables and charts. Frequencies and percentages were calculated.

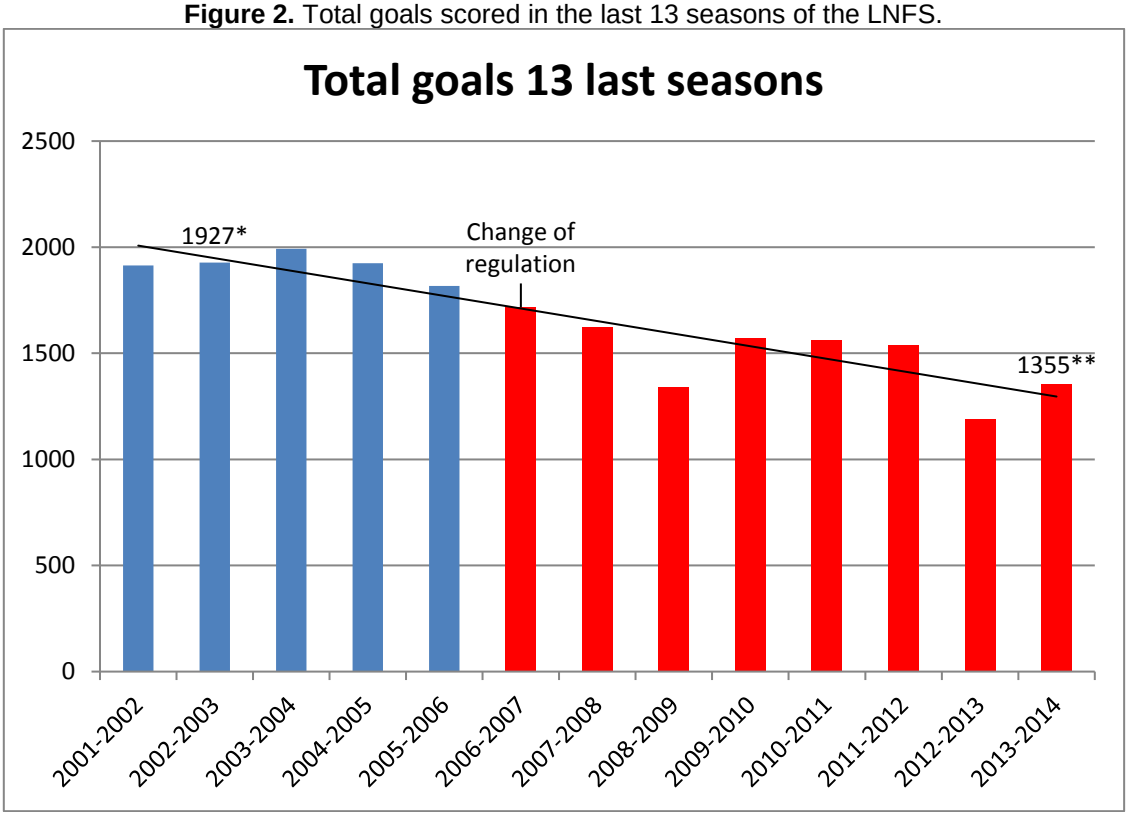
To establish if there was a difference between the goals in both seasons, a comparison of averages was made, it was used the parametric t-Student test, since all the application conditions are met.

The Kolmogorov and Smirnov test was used to check the normal of the data of the seasons, moreover, the Levene test was carried out to check the homocedasticity.

In all the calculation, it was used a α of 0.05

3. RESULTS

Figure 2. Total goals scored in the last 13 seasons of the LNFS.



(*120.38±28.58 goals per team; **90.40±27.72 goals per team; p=0.004)

Table 4. Play goals

Type of play	2002-2003		2013-2014	
	GOALS	%	GOALS	%
STATIC ATTACK	425	37	403	37.7
COUNTER-ATTACK	179	15	228	21.3
REBOUND/CLEARANCE	101	9	100	9.3
PRESSING OVERCOMING	28	2	69	6.4
STEAL	280	24	106	9.9
SECOND POST	86	7	26	2.4
GOALKEEPER-PLAYER	21	2	9	0.8
SUPERIORITY	0	0	1	0.1
INFERIORITY	42	4	85	7.9
GOALKEEPER	2	0	10	1
OWN GOAL	0	0	34	3.2
TOTAL	1164	100	1071	100

Table 5. Strategy goals

Type of strategy	SEASON 2002-2003		SEASON 2013-14	
	GOALS	%	GOALS	%
CORNER KICK	159	26.1	85	29.9
THROW IN	171	28.2	72	25.4
FOUL WITH BARRIER	96	15.8	55	19.4
FOUL WITHOUT BARRIER	22	3.6	2	0.7
DOUBLE PENALTY	125	20.6	42	14.8
PENALTY	34	5.6	28	9.9
TOTAL	607*	100	284**	100

Table 6. Goals depending on the definition zone

Definition zone	SEASON 2002-2003		SEASON 2013-14	
	GOALS	%	GOALS	%
ZONE 1	916	51.7	598	45.7
ZONE 2	678	38.3	430	32.8
ZONE 3	72	4.1	104	7.9
ZONE 4	63	3.6	95	7.3
ZONE 5	42	2.4	82	6.3
TOTAL	1771	100	1309	100

Table 7. Goals depending on the kicking surface

Kicking surface	SEASON 2002-2003		SEASON 2013-14	
	GOALS	%	GOALS	%
INSTEP	645	36.6	702	53.6
INSIDE EDGE	735	41.4	445	34
OUTSIDE EDGE	41	2.3	27	2.1
TOE	233	13.1	118	9
OTHERS	55	3.1	17	1.3
HEAD	62	3.5	0	0
TOTAL	1771	100	1309	100

Table 8. Goals depending on the number of previous passes and the number of players involved in the play

Number of passes	SEASON 2002-2003		SEASON 2013-2014		Number of players	SEASON 2002-2003		SEASON 2013-2014	
	GOALS	%	GOALS	%		GOALS	%	GOALS	%
1-2	1470	83	1102	84.3	1	331	18.6	390	29.7
3-4	269	15.2	194	14.8	2	725	41	575	44
5-6	24	1.4	13	1	3	570	32.2	282	21.5
+ 6	8	0.5	0	0	4	136	7.7	55	4.2
TOTAL	1771	100	1309	100	5	9	0.5	7	0.5
					TOTAL	1771	100	1309	100

4. DISCUSSION

4.1. **Total number of goals** (figure 2)

There is a clear decrease in the total number of goals with the changes in the regulation. In the first two seasons (2006-2007 and 2007-2008) a less decrease than in the subsequent seasons occurred. The suitable tactics to take the maximum advantage of the new regulation have not been already developed, being years later when these tactics have been properly developed and assimilated.

In season 2002-2003, 1927 goals are achieved with an average per team of 120.38±28.58 by 1355 goals in season 2013-2014 and of 90.40±27.72, existing statistically significant differences (p=0.004). This fall in the number of goals ratifies what Cachón et al., (2012) expressed 'the changing regulation conducts to the detriment of the spectacle since efficacy in goals is lost'.

4.2. **Type of play** (table 4)

It goes from a 24% of goals due to steal in season 2002-2003 to a 9.9% in season 2013-2014. Before the changing regulation, the goalkeeper kick the ball with the hand should bounce or touche a player in its own field, what made pressure in the opposing field sense. The changing regulation enables the goalkeeper to throw the ball to the opposing field directly, what practically eliminates the pressure tactics in opposing field, since with an air shot the problem is solved making the defense to be in its own field. The results ratify Cachón's conclusion 'new rules decrease the brightness of the plays favoring a more static game, with less movement and less spectacular' (Cachón 2010).

The goals scored in counter-attacks increase from 15% in season 2002-2003 to 21.3% in season 2013-2014. Facing the possibility of a direct goal kick of the goalkeeper, the defensive withdrawal is much bigger, causing backward defenses, generating an attack against a structured defense that if the ball is stolen creates a counter-attack and numeric superiority.

Cachón et al., (2012) state that the throw in made with the hand allowed to restart the game faster causing a transition and situations of superiority, unlike the current rule, throw in with the foot, that allows the defense to slow the kickoff by placing himself near the ball and making possible the defensive organization. Despite of agreeing with the throw in with the foot slow down the game, the data obtained indicate that the goals achieved by counter-attack have increased, which means that backward defenses create more counter-attacks than the ones created by throw ins.

4.3. **Type of strategy** (table 5)

In season 2002-2003, 607 strategy goals were scored by 284 in season 2013-2014, it goes from a 34% of the total goals to a 22%, what means a reduction of

a third in this type of goals. The absolute values go down very significantly in all categories, except in penalties. For the explanation of this data three groups of variables depending on how the changing regulation affects them have to be distinguished: directly affected (corner kick and throw in); directly affected due to the game change (fouls and double penalty); no affected (penalty).

Corner kick and throw in: it is kept over the 55% of strategy goals but the absolute values fall to the middle confirming the difficulty that the change from throwing in with the hand to the foot has in order to score a goal. This data ratifies what is expressed in Cachón (2012) when they said that the number of goals in strategy plays has been reduced and that a bigger wealth of set pieces could be handled before.

Fouls and double penalty: there is a fall in the absolute values of goals in these actions as a consequence of the change in the way of defending the goal kick. The defenses go backwards and the intense pressure disappears in practically all the pitch, what reduces the number of fouls made and, thus the number of double penalties and goals scored in these actions.

Penalty: the changing regulation does not influence, what is confirmed with the obtained data.

4.4. **Definition zones** (table 6)

In season 2013-2014, most of the goals are scored from zone 1 (45.7%) and zone 2 (32.8%). These results coincide with the ones obtained by other studies in shorter championships. In his study about first division Spanish goalkeepers in the final phase of a championship, Martin (2009) determines that 79% of goals were scored form the last 12 meters. Alves (2010), during the 10 matches analyzed in the Futsal World Cup, obtains that from the 53 goals, the 80% was originated in the last 10 meters. Lapresa et al., (2013), in his study about the shots of the Spanish national team in the last five matches played in the final phase of the 2010 UEFA Futsal Championship, establishes that 78% of the goals are scored from zone 80 which is equivalent to zones 1 and 2 of the present study.

Comparing the results in season 2013-2014 with season 2002-2003 it is observed how the distribution from when the goals are scored changes. The changing regulation in throw ins and corner kicks is one of the reasons of this change. The goals achieved from zone 1 and 2 decrease passing from 90% in season 2002-2003 to 78.5% in season 2013-2014; previously, most of the actions in throw in and corner were finished by shooting with the head in zone 1 and with a short volley in zone 2 due to the bigger precision had throwing with the hand and the impossibility of closing the pass line, what has disappeared since the throw is made with the foot. This data confirm the opinions obtained by Cachón et al., (2012) establishing that ‘it was possible to handle a greater wealth of set pieces before, including head shot and short volleys that now are lost’.

Therefore, goals grow in zones 3, 4, and 5 far from the goal. In season 2002-2003 they were achieved the 10.1% by the 21.5% in season 2013-2014. The difficulty of having direct balls in zone 1 and 2 causes that in most of these actions the ball was thrown to zones 3, 4 and 5 to end with far shots.

4.5. **Kicking surfaces** (table 7)

In season 2013-2014, it is obtained that 53.6% of the goals are achieved with the instep, 34% with the inside edge and 9% with the toe. Lapresa et al., (2013) obtains a similar result with the instep (55%), but different in the goals achieved with the inside edge (22%) and the toe (15%).

The comparative data from seasons 2002-2003 and 2013-2014 show a great rise in the goals scored with the instep passing from a 36.6% to a 53.6% and a reduction in the ones scored with the inside edge passing from a 41.4% to a 34%. These results are related with the zones of finalization. Far shots (zones 3, 4 and 5) have to be done with the foot surface capable of bringing more speed and power to the ball, that is to say, the instep, and the shots near the goal (zones 1 and 2) with the surface that allows more accuracy, that is to say, the inside edge, as Facchin, Seno & Osimani (1999) establish in their training manual.

In season 2013-2014, head goals disappeared due to the great difficulty that poses corner kick or throw in with the hand and then, shoot with the head. Ratifying the advantages of throwing using the hand expressed by Cachón et al., (2012) 'it made difficult to defend all the passing lines and allowed to pass the ball accurately above the defenders, favoring the achievement of a bigger number of goals'.

4.6. **Number of passes and number of players** (table 8)

It is understood that the number of passes previous to the achievement of a goals and the number of players involved in the play are going to give an idea of the speed and rhythm of the game. Percentage differences have not been found in the number of passes previous to the achievement of goal, however, after the changing regulation more goals are scored in plays with less players involved, passing from a 59.6% in plays with 1-2 players involved in season 2002-2003 to a 73.7% in season 2013-2014. This can be a result of the changes in regulations that raises considerably the number of direct throw in shots consistent in pass and throw and the possibility of making direct shots from the goalkeeper to the opponent field. These results show a higher speed in the ending of the plays so the individual game prevails over the collective game. Therefore, it cannot be ratify what is expressed by Cachón et al., (2012) when says that 'the changing regulation has caused a loss of intensity and rhythm in the game'.

5. CONCLUSIONS

- There is and statistically significant reduction in the number of goals from one season to another. In season 2002-2003, 1927 goals were achieved with an average by team of 120.38±28.58, by 1355 goals in season 2013-2014 of 90.40±27.72.

- The change in the rule of goal kick causes backward defenses reducing the percentage of goals achieved by steal in the opposing field that go from a 24.9% to 9.9% and favor the counter-attacks from the own field, passing from a 15% to a 21.3%.

- Strategy goals pass from a 34% of the total to a 22%.

- The modification in the throw in and corner kick rules reduce the number of goals with the inside edge in the zones near the goal and increase the goals with the instep from farther zones. Goals scored with the head disappear.

- The speed of the game does not decrease since the goals are achieved after 1 or 2 previous passes and involving 1 or 2 players in the goal play favoring a more individual game.

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