Disclosure quality of biological assets in agricultural cooperatives.

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Abstract

This research aims to analyse the disclosure quality of biological assets in brazilian agricultural cooperatives. We applied the multivariate statistical analysis, with cluster analysis. And we also analyzed the adherence to the brazilian law about the CPC 29 (Biological Assets and Agricultural Products) in the financial statements and explanatory notes with an amount of the biggest agricultural cooperatives in Brazil. The qualitative stage involved the analysis of the financial statements of cooperative companies listed among the best ones. After the identification of the adherence to the CPC 29, we applied the statistical method of clusters analysis. The results show que these cooperatives still adopt the fair value based on historical cost, without presenting justifications or explanations for the non-adoption of fair value based on market value. The date Manda que the fair value of the method of valuation of biological assets is not consolidated in the cooperatives. Data also show that despite CPC-29 exists since 2009, it is not being fully applied in agricultural cooperatives.

Keywords: Disclosure. Cooperatives. Biological assets. Agribusiness.

1. Introduction

In the year 2017, Brazil had a GDP (Gross Domestic Product) slightly positive, and the industry that kept the Brazilian GDP positive was the Agribusiness sector, combined with a record in harvest. In 2015, the GDP (Gross Domestic Product) in Brazil decreased 3.8% compared to the previous year according to data released by the IBGE (Brazilian Institute of Geography and Statistics). Also according to the IBGE (2015), it was only the seventh time that the country had a negative GDP since 1948 (the year that began the disclosures of GDP):

1981 (-4.3%), in 1983 (-2.9%); 1988 (-0.1%); 1990 (-4.3%); 1992 (0.5%); 2009 (0.1%); and in 2015 (-3.8%). Nevertheless, the reduction of the latter period was the worst in 25 years.

Notoriously against the tide, the only sector of the Brazilian economy that grew in 2015 was the agricultural sector, and ended the year with an improvement of 1.8% compared to 2014. The Brazilian agribusiness still got a gain in the total share of the economy in 2015. As reported by the Confederation of Agriculture and Livestock of Brazil (CNA), it is estimated that the sector got the share of 23% of GDP, compared to 21.4% in 2014.

Driven by the current importance of agribusiness, several studies have been studying the biological assets. In addition to the economic relevance, biological assets are also being studied for being differentiated assets, since they depend on the nature of the conditions, biological mutations and instabilities prices (BACCARIN, 2011; SILVA FILHO; MARTINS; MACHADO, 2013; BOHUŠOVÁ; SVOBODA; NERUDOVÁ, 2012; FIGUEIRA; RIBEIRO, 2015).

Due to its specificities and heterogeneous characteristics, agribusiness has received different treatment of accounting in recent years. In order to adapt the Brazilian Accounting Standards, the Brazilian Accounting Pronouncements Committee (CPC) issued in 2009 the Statement 29, based on IAS 41 (International Accounting Standards Board - IASB), determining from then the accounting treatment and the new forms of disclosures relevant to the assessment and registration of biological assets and agricultural products (BARROS *et al.*, 2012).

In this context, the cooperatives have distinguished themselves in the agribusiness activity, representing 50% of national production, in terms of agricultural production, according to OCB - Organization of Brazilian Cooperatives (2016). The importance of the Brazilian economy sector is emphasized in the OCB 2015 Annual Report, showing that in 2015, the exportations of cooperatives reached 148 countries and totaled $ 5.3 billion. In addition, 10 years ago this share was only US$ 1.6 billion. Six Brazilian cooperatives appear in the list of the 300 largest cooperatives in the world. The turnover of these 300 cooperatives together is $ 2.9 trillion, equivalent to the GDP of France, according to data published by the World Cooperative Monitor and contained in the Annual Report 2015 OCB.

Agricultural cooperatives provide their members financial gains by trading in agricultural products and non-financial gains and indirect support to farmers through the services provided. The relationship between agricultural cooperatives and their members is not limited to these operations, since these organizations have dedicated efforts to implement

new processes and activities that help to create more value for its members (BUAINAIN *et al.*, 2014).

This research aims to analyze the Disclosure Quality of biological assets in Brazilian agricultural cooperatives. According to Figueira and Ribeiro (2015), there has been considerable discussion of the accounting for biological assets nationwide since 2011. However, many cooperatives still work with improvisation (FLACH, 2014). Figueira and Ribeiro (2015) list several studies that investigated the impact of the adoption of the fair value, the application of the CPC 29 and the relevance of the accounting information. Comparative studies on the adoption of Technical Pronouncement - CPC 29 were made by Paul *et al.* (2011), Theiss *et al.* (2011), Zittei, Carpes and Klann (2012), Sahara *et al.* (2011), Smith *et al.* (2013), Barros *et al.* (2012), Dallabona, Mazzioni and Klann (2012), Gonçalves Santos and Szuster (2012), Rech and Oliveira (2011), Martins, Machado and Callado (2014), Cadelca *et al.* (2011), Freire *et al.* (2012), Costa, Almeida e Silva (2011), Silva Filho, Martins and Machado (2013), Scherch *et al.* (2013), Almeida and Holtz (2013), Carvalho *et al.* (2013), Holland (2013) and Scherer, Munhoz and Roth (2014).

Brizolla *et al.* (2014) and Figueira and Ribeiro (2015) also focused their research on the verification of adherence to the CPC 29. However, none of them focused on cooperatives. There is a gap of these studies with cooperatives. Moreover, the growing interest in the area of agribusiness, together with the sustainable development of the environment, accounting disclosure and environmental management in Brazil (BROIETTI *et al.*, 2018). Since the highlight obtained by cooperatives in recent years and particularly in the agricultural sector, this research has the prospect of increasing the scientific knowledge in this sector. This research can show the impact of the use of fair value in the measurement of biological assets that make up the cooperative societies of the agricultural sector and the applicability of the same CPC 29, contributing to the discussions on the topic. The work aims to show whether there is evidence of adaptation to the CPC 29 by these companies and whether disclosure and advertising meets the needs of your external users.

2. Literature Review

The agribusiness or agribusiness is the sum of all operations associated with the production and distribution of agricultural inputs of production operations in agricultural

units, storage, processing and distribution of agricultural products and items produced from them (DAVIS; GOLDBERG, 1957).

The term agribusiness represents the set of operations involving the whole way from the manufacture of agricultural inputs to processing, distribution and consumption of agricultural products. In Brazil, the term agribusiness begins to be used in the 1980s. According to Araújo (2007) the term agribusiness was first applied in newspapers.

2.1. Agricultural cooperatives

The cooperative movement emerged from Europe to Brazil in the twentieth century. The cooperative movement has increasingly established itself in the country because his philosophy has demonstrated the ability to unite social welfare and economic interests, resulting in local development or regions (DUARTE; JESUS-LOPES; SANTOS, 2016).

The concept of cooperative, according to the International Cooperative Alliance (2015), is an autonomous association of persons united voluntarily to meet aspirations and economic, social and cultural common, through a collective owned and democratically managed. Duarte, Jesus-Lopes and Santos (2016) explain that the definition of this concept was discussed broadly within a trial period of over 150 years and 75 affiliated countries.

Brazilian government agencies such as the Ministry of Agriculture of Brazil and National Society of Agriculture (SNA) bring the cooperative is a universal movement of citizens in search of a fairer model which enables the balanced coexistence between economic and social and that cooperatives play an important role in almost all the chains of agribusiness.

The cooperative is an organization that operates in the market on behalf of its members, which are called members. The cooperative members have responsibility for society and the community, but above all about the cooperative members themselves (KEYS *et al.*, 2015). Its main purpose is the pursuit of improving the quality of life of the members, promoting the work with mutual aid, generating income and dividing evenly among workers (MAUAD, 2015).

Compared to capitalist enterprises, cooperatives are distinguished mainly these with regard to aspects of its principles and values (BARRETO; PAULA, 2009). According to Araújo e Silva (2011), by observing the essence of the characteristics of both forms of organization, certain aspects stand out. In cooperative societies, man's needs are the center

and management must meet these requirements, provided there is no commitment by the continuity of the organization.

Table 1: Main characteristics of cooperative societies and enterprises

Cooperative society	Enterprises
Governed by Law 5,764 / 71 and Law 10,406 / 2002.	Governed by the Brazilian Commercial Code and the Law 10.303 / 2001 and 10.406 / 2002.
The central element of the corporate model is the man.	The central element of the corporate model is the capital.
Consisting of 20 or more people.	Consisting of two or more people.
Vote per person.	Vote per person. Vote per share or action.
Democratic control, based on the human element.	Control subordinate to share capital.
The remuneration of the paid-in capital is limited to 12%.	There is no limit to the compensation of paid-in capital.
Quotas can not be transferred to third parties.	The shares may be transferred to third parties, while respecting the law.
Investments guided by the needs of members.	Investments driven by market opportunities.
The results (surplus) return to shareholders in proportion to their operations.	The results (profit) return to shareholders in proportion to the number of shares or shares in the company.
It aims at better salary to the producer, promoting economic welfare.	It aims to maximize profits at the expense of economic welfare.
Defends equity between economic and social objectives.	Supports the commitment to economic, submitting to him the other corporate goals.

Source: Adapted from Araújo e Silva (2011).

In general, a cooperative can have two objective functions, one is to distribute results in cash to its members, and the other would distribute economic outcomes, such as the provision of services with technical assistance and better prices acquisition of agricultural products or sale of inputs (BIALOSKORSKI NETO, 2007; SCHULTZ *et al.*, 2012.).

Under this basis, the agricultural cooperatives have obtained remarkable position of *agribusiness* in Brazil. The production volume numbers, export, associates and generated jobs are expressive (MACHADO FILHO; MARINO; CONEJERO, 2004). According to the OCB (2016), the agricultural cooperatives are formed by farmers and fishers, which belong to the means of production cooperated. They are characterized by the services provided to its

members, as well as the receipt or sale of joint production, storage and industrialization, along with technical, educational and social assistance.

Still according to the CBO (2016), the agricultural cooperative is present throughout the national territory. It is now the best known nationally between the cooperative sectors, has significant share in exports and simultaneously supplies the domestic market of food products.

2.2. Biological assets

In order to establish the accounting treatment and disclosures related to biological assets, the CPC 29 was approved in 2009 and its contents came into effect from 1 January 2010. This Standard was created to adapt the Brazilian Accounting Standards to International, based on IAS 41 (International Accounting Standards Board - IASB).

Under CPC 29 Biological assets are live animals or plants, from birth or planting until the time of slaughter or harvest. After slaughter or harvest, the asset shall be considered an agricultural product and, after being transformed or benefiated, will be recorded in the inventory account (SILVA FILHO; MARTINS; MACHADO, 2013).

Prior to CPC 29 comes into force, the measurement of biological assets in Brazil was governed by NBC-T 10:14 (Agricultural Entities). The valuation of these assets was made at the original value or historical cost, with the recognition of gain or loss only at the time of realization or sale. After the CPC 29, biological assets are initially recognized in the financial statements at fair value less cost of sales, bringing directly to the income statement the adjustment amount (BARROS *et al.*, 2012).

Compared to the fair value, historical cost is more objective and verifiable by its registration be carried out by means of the purchase price. However, over time the the amount recorded at historical cost can be without representation. This may occur by the change in expected future economic benefits, or because of the reduction of the useful life of the asset or the obsolescence (HENDRIKSEN; VAN BREDA, 1999; IUDÍCIBUS, 2010).

With regard to the effects of fair value in the financial statements and disclosure of information, Barros *et al.* (2012) state that the effect determined the fair value has its reflections in noncurrent assets, in equity, and the corresponding deferred tax should affect the income statement. It is noteworthy that not occur a financial change or cash flow, only the financial statements. They will be highlighted with the same international language (IAS 41),

and this allows companies to present a uniformity in their information. This setting inserts the agribusiness segment in international comparability.

Acoording to the IASB, the objective measurement criteria change of biological assets is to provide most updated and relevant information to users of accounting. The purpose of this amendment was to establish regulatory guidelines for a more accurate representation of the financial position of the companies that have biological assets. However, it is important to point out that to assess the fair value of the equity elements, especially those that do not have an active market, require a certain degree of judgment by the evaluator, and can thus impair the reliability of the information and thus counteract the relevance of same (YANG; ROHRBACH; CHEN, 2005; KALLAPUR; KWAN, 2004; SILVA FILHO; MARTINS; MACHADO, 2013).

2.3. Fair value in agribusiness cooperatives

The CPC 29 conceptualizes fair value as the price that would be received to sell an asset or that would be paid by transfer a liability in an orderly transaction between market participants at the measurement date.

The fair value can also be defined as the value resulting from the evaluation of agents that together would reach the amount for which an asset could be exchanged, ie is the meeting point of interests between the buyer and seller in a given transaction (SILVA FILHO; MARTINS; MACHADO, 2013). The measurement of fair value is intended to determine the price that would be received to sell an asset or paid to transfer a liability at the measurement date (exit price).

As for the advantages and disadvantages, Barth (2006) argues that the fair value It has more relevance to the accounting information, as this reflects more faithfully and economic reality of the business, thus helping more effectively to decision making. On the other hand, criticism of this method is that it generates the possibility of distortions in corporate earnings due to earnings management by the use of discretionary values and the existence of information asymmetry between internal and external users, and also the high price volatility of these assets.

According to Barros *et al.* (2012) mandating the measurement and disclosure of biological assets and agricultural produce at fair value has brought doubts and difficulties for companies that fall to this standard. Even with a more open perspective on the international

market, agribusiness companies have faced difficulties in the methodology of choice for the fair value, as there is a variety of species, shapes, utilities, different activities, assumptions and modeling in the evaluation of these assets.

Iudícibus and Martins (2007) explain that by their complex characteristics, there is some difficulty in translating the concept of fair value, as well as being unfeasible its widespread application, which generates several exceptions to the general rule.

To assist in the consolidation of the fair value, on May 12, 2011 was issued IFRS 13 - Fair Value Measurement. Under IFRS 13 is the definition of fair value, the establishment of a conceptual framework for measuring fair value, guidelines on how to address the valuation uncertainty in markets that are no longer active and seeks fair value assessment of transparency with the requirement of detailed disclosures on fair values derived using models (Barros et al, 2012). So there is an effort being employed for the application of fair value is understood, and furthermore to be employed and to provide reliable results.

According to CPC 29, in the measurement of biological assets and agricultural products, it is assumed that there is the ability to determine the fair value reliably, for it has a hierarchy as the situations and possible methods of use:

a) If there is an active market, which is measured at fair value based on this active market;
b) active market of absence, there is the measurement for the most recent transaction price; the market price of similar assets; the industry standard price; and
c) Price unavailable market, so that you use the present value of expected cash flows in determining the fair value.

Rech and Pereira (2012) argue that making the assessment of biological assets at fair value incorporates market conditions by providing useful and relevant information for decision-making, even though in some cases there is a certain degree of subjectivity, due estimates for its measurement.

3. Research Method

Kerlinger (1980) defines design as the plan and the research structure, which allows obtaining answers to the survey questions, that is, it becomes a guide for exploration, collection and analysis of data. Thus, through the research problem structure is a guide for

exploration, collection and analysis of data in order to obtain the information needed to achieve the proposed objectives.

This research is classified as exploratory and descriptive, as it accurately describes the facts and phenomena studied, i.e. the application of CPC 29 cooperative societies in the agricultural sector.

Under the focus of the approach, it is a quantitative research based on methods of multivariate analysis of clusters and cluster analysis. The cluster analysis (cluster analysis) is a multivariate classification, which aims to group data according to the similarities between them. In this method, groups a set of heterogeneous data into groups' homogeneity using a fixed criterion. This is a multivariate statistical method that has recently been applied with greater emphasis on applied social sciences (BEM; GIACOMINI; WAISMANN, 2015).

The approach of this research is based on theoretical and empirical knowledge that allows one to research scientific to the topic. From the point of view of procedures, it is classified as a bibliographical research, documentary and ex-post-facto, since the financial statements 2015 of cooperative societies were analyzed. The study was conducted based on the financial statements for the year 2015 of cooperatives listed among the best companies according to Exame Magazine - Biggest and Best edition 2016, in the agricultural sector.

Of the 30 largest companies listed by the magazine, 17 are cooperatives, and this study analyzed 12 cooperatives (70.58% of the population of listed cooperatives). The classification criteria used by Exame Magazine - Biggest and Best 2016 to rank companies was Revenues with Sales in dollars, with no distinction between public companies or closed, national or foreign capital.

The financial statements were obtained from the websites of the companies, and in five cooperatives that was not possible. We contacted them by email and phone, but we have not seen in our poll.

The analysis of biological assets of the selected companies were in order to verify the impact of adopting the fair value on the measurement of biological assets by analyzing the explanatory notes, in order to detail the financial information on biological assets are disclosed in the companies surveyed.

To achieve the proposed objective, it performed the analysis of the content of the notes to the 12 cooperatives under study. It was used as a metric issues involving the application of IAS 41 / CPC 29 - Biological Assets and Agricultural Product, checking on the analysis, if companies use the following items: a) The reports refer to IAS 41 and CPC 29? ; b) biological

assets are shown on separate lines in the financial statements ?; c) there are specific notes for biological assets ?; d) gains or losses are disclosed to changes in the fair value ?; e) are disclosed separately from the total change in fair value, minus the biological assets selling expenses resulting from physical changes and market price changes, included in the result ?; f) the company uses the measurement of biological assets at cost, decreasing depreciation and accumulated impairment loss on ?; g) if the company does not measure the fair value reliably occurs disclosure explaining the reason ?; h) companies use some range of estimates within which there is high probability of finding the fair value ?; i) companies disclose the depreciation method used ?; j) companies identify and disclose the depreciation rate and / or the life ?; k) is the disclosure of the total amount and the accumulated depreciation at the beginning and end of the period ?; l) the company discloses biological assets previously measured at cost, less the amount of depreciation and impairment, which have become measurable at fair value ?; m) are disclosed information on the risk of biological assets? We adopted as a metric to measure the results, "yes" to each response in which the companies in the study meet certain information required by CPC 29, and "no" to those whose answer did not provide the information required by CPC 29.

4. Analysis and Discussion of Results

Initially identifies the companies in the sample, with its name, location, revenue in 2015 (in thousands of US $), percentage of sales growth, profit value in US $ (in thousands) and profitability percentage, according to Table 2.

Table 2: Financial data of the Cooperatives

Cooperative	State	Revenue 2015 - US $ thousands	% Growth in revenues	US $ Income (thousands)	% profitability
COAMO	PR	2695.4	13.2	182.4	17.4
C.VALE	PR	2457.1	8.3	39.1	10.9
COCAMAR	PR	835.1	6.7	28.7	13.0
Copagril	PR	345.1	3.7	7.7	10.7
COASUL	PR	341.6	12.1	13.7	20.7
Copacol	PR	752.2	10.2	53.5	18.2
WITH ME	GO	701.1	-6.8	27.5	7.7
INTEGRATED	PR	619.2	12.9	15.5	12.2
Castrolanda	PR	584.4	6.3	12.9	5.3

Coopavel	PR	519.7	8.8	12.8	16.2
FRIMESA	PR	515.9	1.9	16.4	12.6
FRISIA	PR	498.2	10.9	18.9	10.6

Source: Own elaboration.

Considering all descriptive statistics presented in Table 3, we can see a large variability in revenues of all Cooperatives. On average, the Cooperatives had a good level of revenue growth and good profitability.

Table 3: Descriptive statistics of the accounting data of Cooperatives

	N	Minimum	Maximum	Average	Standard deviation
Revenue (thousand USD)	12	341.6	2695.4	905.417	795.7311
Growth in revenues	12	-6.8	13.2	7,350	5.6896
Income (thousand USD)	12	7.7	182.4	35.758	47.9967

Source: Own elaboration.

According to Table 3 and Figure 1 you can see the greatness and strength of Cooperatives in agricultural branch, and these companies are classified among the 30 largest companies by revenue, according to the classification of Exame Magazine - Biggest and Best 2016. In Figure 1, contained by cluster analysis that emerges Coamo in revenue and profitability. It was also a cluster of cooperatives with profitability and revenues approaching with low standard deviation and variance between them, these variables.

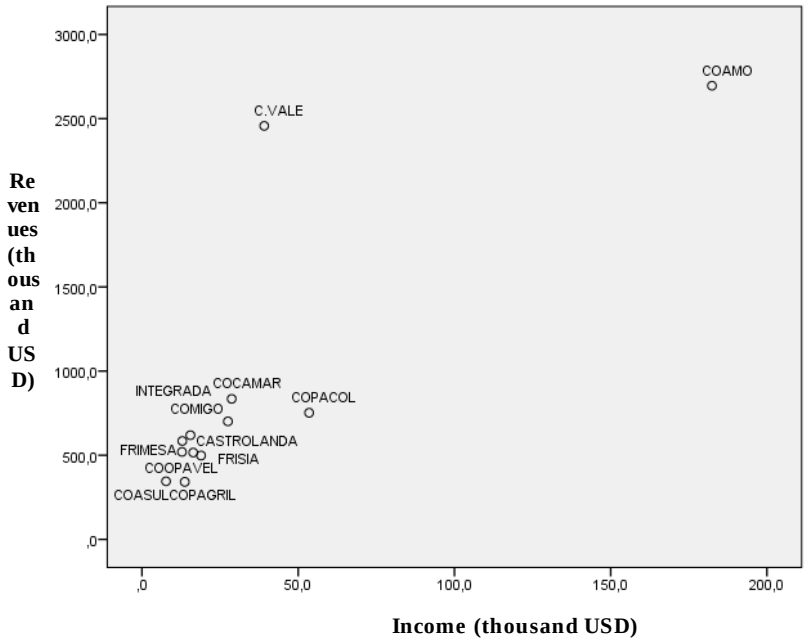

Figure 1: Cluster Analysis of the Cooperatives
Source: Own elaboration.

Table 4 numerically shows that the Cooperatives Coamo and C.Vale emerge in terms of profitability and revenues. The statistical method of cluster analysis identified the existence of three groups of revenues and profitability, and these were measured from the Euclidean Square distance, with data in thousand units.

Table 4: Cluster Analysis and Euclidean square distance of the Cooperatives

	1: Coamo	2: C.Vale	3: Cocamar	4: Copagril	5: Coasul	6: Copacol	7: Me	8: Integrated	9: Castrolanda	10: Coopavel	11: Frimesa	12: Frisia
1: Coamo	0	77,322	3484340	5554430	5568834	3792641	4001227	4338462	4485051	4762435	4777776	4854420
2: C.Vale	77,322	0	2630992	4461530	4475985	2906891	3083671	3378433	3507692	3754210	3768773	3837697
3: Cocamar	3484340	2630992	0	240541	243767	7487	17957	46787	63100	99730	102 040	113598
4: Copagril	5554430	4461530	240541	0	48	167828	127128	75,192	57292	30511	29248	23565
5: Coasul	5568834	4475985	243767	48	0	170 176	129431	77065	58952	31720	30388	24551
6: Copacol	3792641	2906891	7487	167828	170 176	0	3287	19133	29805	55713	57214	65713
7: Me	4001227	3083671	17957	127128	129431	3287	0	6852	13832	33122	34422	41242
8: Integrated	4338462	3378433	46787	75,192	77065	19133	6852	0	1218	9908	10672	14653
9: Castrolanda	4485051	3507692	63100	57292	58952	29805	13832	1218	0	4186	4705	7466
10: Coopavel	4762435	3754210	99730	30511	31720	55713	33122	9908	4186	0	27	499

11: Frimesa	4777776	3768773	102 040	29248	30388	57214	34422	10672	4705	27	0	320
12: Frisia	4854420	3837697	113598	23565	24551	65713	41242	14653	7466	499	320	0

Source: Own elaboration.

The proximity matrix, measured by Euclidean square distance, and is represented in Table 5, showed a dissimilarity matrix.

Table 5: Proximity Matrix of Cooperatives, the Euclidean square distance

	1: Coamo	2: C.Vale	3: Cocamar	4: Copagril	5: Coasul	6: Copacol	7: Me	8: Integrated	9: Castrolanda	10: Coo-Pavel	11: Frimesa	12: Frisia
1: Coamo	0	77321.8	3484339.8	5554430.2	5568834.1	3792641.4	4001226.5	4338462.0	4485051.2	4762434.6	4777776.2	485442090
2: C.Vale	77321.8	0	2630992.1	4461529.9	4475985.4	2906891.3	3083670.5	3378433.3	3507691.7	3754210.4	3768772.7	3837697.2
3: Cocamar	3484339.8	2630992.1	0	240,541.0	243,767.2	7487.4	17957.4	46787.0	63100.1	99729.9	102,039.9	113,597.6
4: Copagril	5554430.2	4461529.9	240,541.0	0	48.2	167,828.0	127,128.0	75191.6	57291.5	30511.1	29248.3	23565.0
5: Coasul	5568834.1	4475985.4	243,767.2	48.2	0	170,176.4	129,430.7	77065.0	58952.5	31720.4	30387.8	24550.6
6: Copacol	3792641.4	2906891.3	7487.4	167,828.0	170,176.4	0	3287.2	19133.0	29805.2	55712.7	57214.1	65713.1
7: Me	4001226.5	3083670.5	17957.4	127,128.0	129,430.6	3287.2	0	6851.6	13832.0	33122.0	34422.2	41242.3
8: Integrated	4338462.0	3378433.3	46787.0	75191.6	77065.0	19133.0	6851.6	0	1217.8	9907.5	10671.7	14652.5
9: Castro-Landa	4485051.2	3507691.7	63100.1	57291.5	58952.4	29805.2	13832.0	1217.800	0	4186.1	4704.5	7466.4
10:-level Coopa	4762434.6	3754210.4	99729.9	30511.1	31720.4	55712.7	33122.0	9907.540	4186.1	0	27.4	499.4
11: Frimesa	4777776.2	3768772.7	102,039.9	29248.3	30387.7	57214.1	34422.2	10671.700	4704.5	27.4	0	319.5
12: Frisia	4854420.1	3837697.2	113,597.6	23565.0	24550.6	65713.1	41242.3	14652.560	7466.4	499.4	319.5	0

Source: Own elaboration.

Table 6 shows the combined clusters according to the cluster planning, in accordance with the use of multivariate statistical method of cluster analysis.

Table 6: Agglomeration Planning in Cluster analysis of Cooperatives

Internship	Combined cluster		Coefficients	The stage cluster is displayed first		Next stage
	Cluster 1	Cluster 2		Cluster 1	Cluster 2	
1	10	11	27,400	0	0	3
2	4	5	48.250	0	0	9
3	10	12	319.540	1	0	6
4	8	9	1217.800	0	0	6
5	6	7	3287.210	0	0	7
6	8	10	4186.100	4	3	7
7	6	8	6851.610	5	6	8
8	3	6	7487.450	0	7	9
9	3	4	23565.050	8	2	11
10	1	2	77321.780	0	0	11

11	1	3	2,630,992.160	10	9	0

Source: Own elaboration.

The number of clusters, by weight, is shown in Figure 2, based on data from agribusiness cooperatives analyzed in this research.

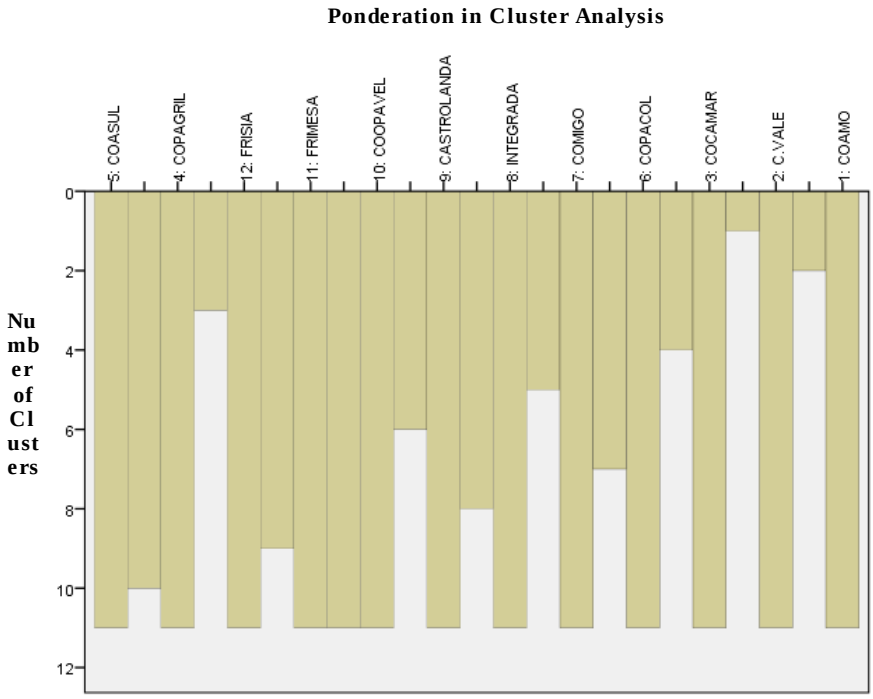

Figure 2: Number of Clusters of Cooperatives
Source: Own elaboration.

In Figure 3 is shown the Dendogram of clusters of agribusiness cooperatives. Dendo in its etymology means tree. That is, it is a specific type of diagram or representation that organizes certain factors and variables. It resulted from the cluster statistical analysis with accounting data of agribusiness cooperatives. This quantitative method led to clusters and their ascending hierarchical ordering, and this graphically resembles the branches of a tree that will be divided in other branches successively.

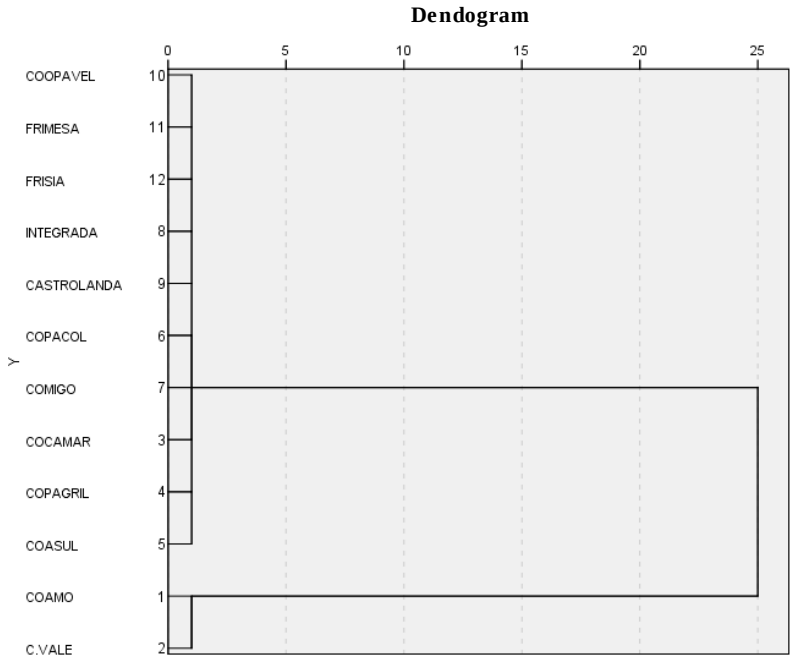

Figure 3: Dendogram with the Clusters of Cooperatives
Source: Own elaboration.

All Cooperatives sample listed in Table 01, present in their financial statements and Notes, biological assets and agricultural products.

Table 7 shows the classification of biological assets in the financial statements and the identification carried out on regular or not with the CPC 29.

Table 7: Classification of biological assets and agricultural products in the Balance Sheet

Cooperative	Ranking	Assets	Non-current assets - RLP	Non-current assets Property
COAMO	Biological assets			19,972,050
	Agricultural products	915135878		
C.VALE	Biological assets	93,794,278	3200257	
	Agricultural products	294218913		
COCAMAR	Biological assets			16,954,000
Copagril	Biological assets			309 222
	Agricultural products	95,554,586		
COASUL	Biological assets			1777658
	Agricultural products	18,223,674		
Copacol	Biological assets	25,516,040		38,286,104
	Agricultural products	22,349,773		
WITH ME	Biological assets			42,655,106

INTEGRATED	Biological assets		1452823
	Agricultural products	122 632 614	
Castrolanda	Biological assets		21,367,000
	Agricultural products	11,954,000	
Coopavel	Biological assets		7745696
FRIMESA	Biological assets		2586135
FRISIA	Biological assets		11,893,000
	Agricultural products	50,569,000	

Source: Own elaboration.

The C.Vale, unlike other cooperatives, has a value as Non-Current Assets - Long-term, in the case of immature biological assets that require more time to become ready for production. However, there is a uniformity in the use of CPC 29, treating agricultural product inventories to current assets and biological assets as non-current assets - Property, plant.

Table 7 presents the lists of items disclosed in the financial statements and notes of the companies analyzed with reference to disclosure of fair value for the biological assets, for the year 2015.

From the analysis of Table 8, item 1, is identified in the description of accounting policies used in the financial statements, only 50% of the surveyed cooperatives, state that used the rules of IAS 41 / CPC 29, with respect to its biological assets.

Table 8: Items disclosed determined by CPC-29 - Fair value of biological assets

		Yes	%	Not	%
1	The reports refer to IAS 41 and CPC-29	6	50	6	50
2	Biological assets are shown on separate lines in the financial statements	10	83.3	2	16.7
3	There are specific notes for biological assets	10	83.3	2	16.7
4	Gains or losses on changes in fair value are disclosed	0	0	12	100
5	They are disclosed separately from the total change in fair value, minus the cost of sales of biological assets due to physical changes and market price changes, included in the result.	0	0	12	100
6	The cooperative uses the measurement of biological assets at cost, decreasing depreciation and accumulated impairment loss in	10	83.3	2	16.7
7	If the cooperative does not measure the fair value reliably occurs disclosure explaining the reason	2	16.7	10	83.3
8	Cooperative do / use some form / range of estimates within which	3	25.0	9	75.0

	there is high probability of finding the fair value				
9	Cooperative disclose the depreciation method	9	75.0	3	25.0
10	Cooperative identify and disclose the depreciation rate and / or life	8	66.7	4	33.3
11	Is the disclosure of the total amount and the accumulated depreciation at the beginning and end of the period?	10	83.3	2	16.7
12	The cooperative discloses biological assets previously measured at cost, less the amount of depreciation and impairment losses that have become measurable at fair value	1	8.3	11	91.7
13	Information on the risk of biological assets are disclosed	0	0	12	100

Source: Own elaboration.

With respect to item 2 and 3 of Table 3, two cooperatives although they have in their statements Biological assets, there was the highlight of them in your balance sheet, and also there were no notes on them, i.e., a non-compliance to CPC 29.

Items 6 to 11, in Table 3, refer to the situation in which the company evaluates its biological assets at cost, considering the same as fair value. In this case, the CPC 29, in its paragraph 54, states that if the entity measures biological assets at cost less depreciation and any loss in accumulated impairment at the end of the period shall disclose: a description of the biological assets; one reason the explanation for which fair value cannot be measured reliably; if possible, the range of estimates within which there is a high probability of finding the fair value; the depreciation method used; the useful life or the depreciation rates used; the total gross and accumulated depreciation (added by the cumulative loss impairment) at the beginning and end of the period.

Kruger *et al.* (2014) presents us in his study of Santa Catarina cooperatives, with respect to agricultural products, 44% of the cooperatives reported that recognized at fair value, less costs to sell of agricultural produce harvested during the period, determined at the time of harvest. As for the other cooperatives (56%) were agricultural products at cost of acquisition (historical), or did not disclose the methods and assumptions used to recognize and highlight the agricultural products.

We find that in item 6, ten (10) of the twelve (12) unions claim to use the cost of production as the fair value of its biological assets, however, the same number applies the cost due to the difficulty of determining correctly the fair value on the basis of its biological assets characteristics - item 7. Regarding this issue, companies should make estimates within a given output range, for example, if the biological assets are animals, which is classified by age

group, and seek reliable estimates for determining the fair value for each of these age groups. What is noticeable that the item 8 of Table 3, only three companies used this estimate, but the notes, bring few details of how this was done.

With respect to items 9 and 10 of Table 3, it is noteworthy that some companies fail to identify the depreciation method used and do not disclose their depreciation rates, and in our case, as it comes to biological assets, life in certain situations it is extremely important that identification, as in this case, comes the question of identifying the risks involved in the activity.

With regard to item 11, was identified in the notes that two companies did not disclose the values its non-current assets (fixed and biological assets), according to CPC 29, referring to paragraph 54 letter f.

Table 3, in its paragraph 12, it appears that only one of the companies under study, is part of the item 56 of CPC 29. This item points out that if the fair value of biological assets previously measured at cost less any depreciation and loss in accumulated impairment become reliably measurable during the current period, the entity shall disclose: a reason explanation of why the measurement of fair value has become reliably measurable; the effect of the change; a description of the biological assets.

Despite appearing in a note this change, there is by contrast a description of the biological assets involved in this process and there is no explanation of why fair value has become reliably measurable, and nothing is said about the effects of changes, and the impact that the outcome of the entity.

Second working Kruger *et al.* (2014) 89% of the cooperative measure biological assets and agricultural products at cost less any depreciation and accumulated loss on impairment. However, the percentage of 67% of them shows which assets were measured by these criteria. None of the unions has a reason explanation of why fair value cannot be reliably measured or presents estimates the possibility of finding fair value.

Finally, in any of the companies surveyed was found to be notes or any other information on the risks associated with biological assets. Item 53, the CPC 29, elaborates on this subject, to strengthen the need for such disclosure, as companies that have this activity have the constant presence of the risk associated with your product. Both agriculture such as livestock farming, are exposed to climatic, disease and other natural risks, that its occurrence is directly reflected in the entity's results, hence the need for their disclosure.

5. Final Considerations

In this research, we analyzed the disclosure quality of biological assets in Brazilian agricultural cooperatives. We applied the multivariate statistical analysis, with cluster analysis. Moreover, we analyzed the adherence to the Brazilian law about the CPC 29 (Biological Assets and Agricultural Products) in the financial statements and explanatory notes with an amount of the biggest agricultural cooperatives in Brazil.

Sought by CPC analysis 29 - Biological assets and agricultural products, the financial statements and explanatory notes of these cooperatives verify that the concepts of fair value are met and disclosed by these companies.

We applied a survey with thirteen items: seven items (54%) were attended by the cooperatives, three of them have been met with little impact (23%) and three of them have not been met (23%), which you can deduce that there is no little understanding of the application of CPC 29 in the financial statements in this economic activity. For example, only two companies had a reason explanation of why fair value cannot be reliably measured, but no company discloses information on the risk of biological assets.

No company reported gains or losses on changes in fair value, as well as any company released the total changes in fair value resulting from physical changes and included in income price changes. When it comes to biological assets, physical changes occur in each period, and then it is assumed that occurred, and should be identified and disseminated, even if you apply the cost as fair value.

Results obtained in this study it was observed that the cooperative study also adopt historical cost as fair value, without giving reasons or explanations for not adopting the fair value based on market value, which shows that the fair value as method of valuation of biological assets are not consolidated in the cooperative study. So perhaps the ease of measuring at historical cost, you lose important information relating to these items, and notes that the CPC-29, despite being in force since 2009, is not applicable in full by these companies.

The contributions of this article to the literature focus on highlighting the economic role of agricultural cooperatives, as well as its position in the market environment. These come to be understood in a context where agricultural markets today are characterized by: lower margins; higher price and income volatility due to the reduction of government

involvement and international competition; trend toward fewer farms, which are larger and more specialized; few agricultural cooperatives and promote its development; market with innovative products with a shorter life cycle; the fact that the new form of food consumption is increasingly shaped by the demands for variety, food safety, convenience and the environment; huge concentration at the end of the consumer market;

It is known that the type of society and its legal form, they are not required to disclose its financial statements, however, they all disclose through their electronic sites. It is also known that cooperatives are an important part in the agricultural segment of the Brazilian agribusiness, which is rapidly developing with international recognition, there is understood to be important to adaptation to the total set of Accounting Pronouncements (CPC), seeking comparability with companies in the same industry, but with shares on the stock Exchange.

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