Meso-institutions: the bridge for the success of food policy

Meso-instituições: a ponte para o sucesso das políticas de alimentos

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Resumo

Considerando meso-instituições como camadas intermediárias que conectam instituições e organizações, este estudo investiga o relacionamento entre meso-instituições - embasadas em agentes com objetivos comuns - e a efetividade de política de alimentos. Utiliza-se uma base de dados única com micro-dados sobre qualidade do leite de vaca no Brasil. A análise empírica se pauta em uma combinação da abordagem de diferença-em-diferenças com *matching* para investigar os impactos da presença de meso-instituição face uma nova política de alimentos. Os resultados sugerem que a função de tradução de tal estrutura aumenta a efetividade da política, bem como destaca uma lógica sequencial de implementação de política pública de efeitos institucionais (primeira-ordem) a efeitos de tecnologia e tamanho (segunda-ordem). O estudo contribui para a literatura de política alimentar evidenciando que qualquer regulação que deseja ser implementada com sucesso deve ser primeiramente traduzida para então ser monitorado e controlada.

Palavras-chave: meso-instituições; política de alimentos; efetividade.

Abstract

Assuming meso-institutions as intermediary layers that link institutions and organizations, this study analyzes the relationship between meso-institutions and food policy effectiveness when the former are guided by agents with common objectives. We use a unique dataset with micro data on cow milk quality from Brazil. The empirical analysis combines a Difference-in-Differences approach with matching to investigate the impacts from the presence of the meso-institution facing a new food policy. Our results suggest the function of translation from such structure increases the food policy effectiveness, as well as underline a sequential logic of policy implementation from institutional (first-order) to technology and size (second-order) effects. The paper contributes to the literature of food policy and brings implications for policy in general, advocating that any regulation to be successfully implemented should be firstly translated and, then, enforced and monitored.

***Key words**: meso-institution; food policy; effectiveness*

1. INTRODUCTION

In general, food policy studies have addressed the public policy effectiveness based on the explicit relationship between the policy and its effects in the affected subject (i.e. farmers). Traditionally, farmers' characteristics, such as education, size, technology and others, have emerged as the sources of the heterogeneity in results of the regulation. However, there is a relevant layer between the regulation and the impacted agents which is responsible for the implementation and has been ignored by those studies, the so-called meso-institutions. We, in turn, focus on this intermediary-level taking into account that how the food policy is implemented also matters for its results.

In some cases, the policy failures come from the institutional structure which does not provide an adequate environment to implementation due to inefficiency in translation of rules' complexity (Hassanein, 2011, Ragasa et al., 2015, Van Tongeren, 2008). By that, we assume that meso-institutions either do matter to agricultural policy progress (Ragasa et al., 2014). We adopt a recent stream on economics which has focused public policy analysis based on those aspects, the meso-institutions approach (Ménard, 2014, 2016, 2017, Rouviere and Royer, 2017). This new background applied to the umbrella of food policy is considerable relevant because it can address the contemporary challenges of food security and safety around the world, such as the worldwide concern of population and food consumption growth (Barrett, 2010, Godfray et al., 2010, FAO et al., 2017).

This stream is the new research frontier to the New Institutional Economics and public policy analysis (Ménard, 2018). According to Ménard (2017), meso-institutions are such relevant because they "determine and enforce specific rules delineating the domain of possible transactions". For instance, regulatory agencies or public private partnerships can be assumed as these kind of devices (Rouviere and Royer, 2017).

These intermediary-level institutions can assume three distinct functions: translate, implement or monitor rules and rights. Here, we focus exclusively on the translation part. In doing so, this study considers them as *"in charge of translating them into rules specific to a sector, a region, a type of activities, through identifiable mechanisms of implementation and control"* (Ménard, 2016). An illustration of such translation is a political reform in European Union, where each state member depends of an intermediate institutional arrangement to adequate the general rules changing to your own territory.

We study if the prior existence of a meso-institution increases the efficiency of an institutional change (e.g. new public policy) to agents which are directly affected by such structure. We are not interested in investigate the heterogeneity over distinct meso-institutions and organizational arrangements (Ménard, 2017). Instead, we want to study if agents with previous access to a determined implementation arrangement (meso-institution) present better policy outcomes rather than the others without it. Our conceptualization of meso-institution follows Becker (1983)'s model. Considering political influence groups which control free-rider problems and consider homogeneous objectives of their members, a meso-institution can be efficient in translating policy in an egalitarian manner. In sum, it involves to align the interests of the involved agents to a common direction.

Our objective is to apply this approach in the Brazilian cow milk industry, where new policies have emerged and highlighted the meso-institutions' role. The cow milk industry in Brazil experienced deregulation processes over the las years. A remarkable event was the creation of meso-institutions to support milk policy implementation along the Brazilian territory. Those structures were named as *Conselho Paritário entre Produtores e Indústrias de Laticínios* (Conseleite)

(Canziani and Guimarães, 2003). Formed by milk farmers and processors, Conseleite is a state-level arrangement that translates technical and complex parameters from national milk regulation through local information of price which servers as reference to the negotiations in transactions of milk supply. We assume the Conseleite as an efficient meso-institution because it has a distinguished characteristic that the involved parts have equal participation aiming the development of the interests of both. Therefore, following Silva et al. (2012), Conseleite is an intermediate ("meso") institutional arrangement that provides an environment which enhance implementation of milk policies ("macro") to farmers and processors ("micro"). According to the author, it is a state-level organization which has been strongly used in the Brazilian regions where it was created: Paraná (2002), Rio Grande do Sul (2004), Santa Catarina (2007), Mato Grosso do Sul (2011) and Rondônia (2014).

After the Conseleite establishment, a new policy of cow milk emerged. It was the *Instrução Normativa* 62 of December 29, 2011 (IN 62/2011), which regulates the changes in quality parameters in milk production, storage and transportation (MAPA, 2011). The new regulation exposes technical parameters of minimum quality level of the milk in order to establish food security. Some specific indicators became to be adopted as references in the remuneration of milk supply transaction in the industry, such as total bacteria level (TBL), somatic cell level (SCL) and the percentage of protein lactose (PL), percentage of protein (PP) and total solids (TS). The first two are negatively correlated with milk quality and represent the sanitary health of the product, such as if it was contaminated by any animal disease, bacteria, etc. The others are positively correlated with the milk quality and serve as attributes to dairy production. For instance, the higher the levels of these three aspects, the larger will be the scope of their use in milk-based products for specific high-quality market niches (e.g. yogurt enriched with protein, better butters, cheeses, etc.). Consequently, the better is the quality of the milk in the presence of lower levels of TBL and SCL and higher levels of PL, PP and TS.

We aim to study if **the earlier existence (i.e. presence) of a meso-institution increases the efficiency of a new food policy implementation**. Specifically, if Brazilian states with Conseleite have better outcomes from the policy than the others, due to the long-terms benefits from a more adequate institutional structure of policy implementation. By that, the present study addresses the following research question: **how does prior existence of meso-institutions impact food policy implementation?**. To do so, we perform a Difference-in-Differences approach (DiD henceforth) with matching in a unique dataset with micro data on cow milk quality from Brazil.

The paper has six sections. Section 2 presents the theoretical foundation. Section 3 describes the Brazilian sector of cow milk. Section 4 uncovers the methodology. Section 5 reports the results, theoretical and managerial implications. Section 6 exposes the conclusion.

2. THEORETICAL FOUNDATION

Since Cochrane (1949)'s work large efforts have been made in agricultural policy analysis. Following his agenda, agricultural economists and food scholars have adopted an *"analytical work concerned with tracing the consequences of pursuing a given policy"*. Although, beyond the economic impact from a food-related policy and the explanations based on farmers' characteristics in policy failures, institutional focuses have received far less attention. It is possible to explain why a policy fails *a la* why nations fail (Acemoglu and Robinson, 2013), but there is a lack to figure out why a food policy goes locally wrong inside the same institutional environment. Ménard (2016) advocates that there is intermediate-level ("meso") institution that explain this difference in policy outcomes by considering the institutional structure as multi-, not bidimensional (macro vs micro). Some examples from distinct countries guide to the choice of this multidimensional institutional approach.

Saint Ville et al. (2017) investigate the case of agricultural policy in Saint Lucia and claim attention to the need in consider a systematic standpoint to foster effectiveness in food policy implementation. They emphasize that there are distinct levels of institutions responsible for food policy development which have to be well-structured, otherwise the disconnection between them results in failures in regulation. Contrary to the common sense, the policy cannot to be only producer-, consumer- or technology-oriented, but also institutional-guided.

Reardon et al. (2017) emphasize the dynamic aspect of agri-food sector in developing economics, specifically the importance of the institutions changing. They argue that there are constant changes at the local, regional or global levels that policy-makers have to take into account, otherwise *"analyses and policies that do not recognize these dynamics may be not be effective or even counterproductive."*

Jayne et al. (2018) make a review of input subsidy programs in sub-Saharan Africa as well as present several factor that affect the effectiveness of them. An interesting finding is that some households figure out better the rules' functioning and obtain advantages from it. They illustrate that the policymakers' or impacted agents' interpretation of all local or regional aspects involved in a policy is crucial, even that implicit factors, such as social constraint or political influence locally centered.

Especially focused on Common Agricultural Policy of European Union, Erjavec and Lovec (2017) argue that the agricultural policy analysis has changed from the traditional perspective of agricultural economics to the institutional approach, focusing on the role of institutions' enforcement, communication flow, etc. Even indirectly, they drawn attention to the need in change from the analysis of policy's welfare effects to the "selling policy" approach, which explores the (un)success factors in policy implementation. Beyond other contributions, they shed some light on the fact that agricultural economics studies should change the policy analysis to a background which regards farmer's knowledge and access to information. In sum, the authors claims attention that the research of agricultural policy should broader their theoretical approaches to an interdisciplinary background which inserts some social and political basis. In general terms, this is what we do here by adopt the meso-institution approach.

In addition, Hedley (2017) exemplifies the policy effectiveness and governance in agri-food chains in Canadian Agricultural. He concludes that one way to enhance the development of agriculture and food policy in that country is an integrated model of policy-making, considering the interdependencies between different institutional levels, namely federal (F), provincial (P) and territorial (T). In his words, the different outcomes from an institutional change comes from *"creative institutional arrangements in agriculture [that] have emerged over many years to provide working relationships among F–P–T governments."*

Following this need for an interdisciplinary approach to analyze food policy, we attach the agenda for development of the New Institutional Economics and public policy, the meso-institution approach (Ménard, 2018). According to this author, the meso-institution approach assumes that the interplay between institution and organization does not occur directly. The connection between both extremes is performed by an intermediate-level institution which can be responsible for three different objectives: translate, implement or monitor the involved rules and rights. Main examples are the performance of regulatory agencies' or public-private partnerships' influences on a policy implementation.

In specific terms, meso-institutions are a set of devices that surround the effectiveness of a policy (Ménard, 2014). They are responsible to: i) monitor if the rules are being followed; ii) implement the incentives and sanctions when the agents' behavior do not meet the rules specification; and iii) translate the general rules to a specific locally or regionally centered reality (e.g. a European Union's law being adapted to the case of a specific EU member country). For our study, we exclusively focus on the translation part as detailed in the next section.

The relevance behind the translation function of the meso-institutions is that the rules are not fully accepted and internalized by economic agents. Indeed, *"the macro-institutional level of the polity, the judiciary, general customs, etc. require specific enacting devices that can 'translate' and adapt them to specific circumstances..."* (Ménard, 2016). This recent approach has been shown a promising research field to policy analysis, such as in the cases of water and food public-private partnerships.

Ménard (2017) presents the cases of the water sector in France, England and Netherlands. The author emphasizes the role of regulatory agencies and other kinds of meso-institutions in water provision due to rules and rights coordination. Beyond the macro- (rules) or micro-institutional level (agents), he emphasizes that the economic efficiency in terms of investments and quality of the service depends directly on the role of regionally- or locally-centered actions (meso). In addition, Rouviere and Royer (2017) illustrate the food safety issue in the sectors of cattle in Canada and vegetables in France under the public-private partnerships umbrella as a meso- institution. Their study highlights the relevance in merge the public and private actors in a single institutional context to better control incidents of food safety. They identify that those meso-level structures are quite relevant to provide incentives and diminish uncertainty and asymmetric information. Therefore, the meso-institution research field is promising.

On the other hand, a gap still remains. Any empirical and quantitative-based study was done. Consequently, aiming to address this gap in the literature and changing the focus of meso-institution creation (Ménard, 2014, 2017), we drawn attention to the long-term benefits in the foundation of a meso-institution for new policies over time. In other words, we investigate if this intermediate architecture can boost the implementation of further institutional changes.

We believe that a meso-institution can provide institutional support not only on the period of its creation, but also for the implementation of future new policies, even after a considerable period of time. By that, we intend to theoretically contribute for this new theory by adding a new evidence about the long-term impacts of the creation of a meso-institution in a food policy context. In general terms, our research design also contributes for the food policy literature by bringing a new integrated model about institutions and their impacts in policy-making. Following the claims from Erjavec and Lovec (2017), Hedley (2017), Jayne et al. (2018), Reardon et al. (2017), Saint Ville et al. (2017), we shed some light on an umbrella which takes into account the different institutional levels to implement a food policy, highlighting the need to absorb the gap between institutions and organizations.

3. BRAZILIAN COW MILK SECTOR: A BRIEF OVERVIEW

The cow milk sector is an important driver in Brazilian economy. The country has been one of the worldwide leaders in that industry. In 2016, Brazil was the second largest player in the number of livestock in the world with more than 19 million of cows, only behind India. The country also appeared as the fourth largest producer with more than 33 billion of liters, only behind United States, India and China, respectively. Moreover, the Brazilian cow milk sector is quite relevant to the South America. The country is the leader producer in both the number of animals and liters of production in the South American context, representing 59% and 56%, respectively (FAO, 2016).

The industrial organization of such industry presents interesting characteristics. Along of the vast Brazilian territory with more than 8.5 million of squares kilometers of extensions, there are more than 1.3 million of milk farmers, 2 thousand registered milk processors, direct and indirect employment of 4 million of workers involved with some stage of the milk activity and an average of Brazilian population consumption of 60 liters per person per year. This sector generates about 18.5 billion dollars counting the milk production in its all business operations (EMBRAPA, 2016). Besides that, the sector includes many of the leaders processing firms in the world, such as such as Nestlé, brand branches from BRF and J&F groups, and others.

Specifically in the primary production, the organization of the transactions illustrates distinguished characteristics that highlight the meso-institutions' role. The economic organization of the milk farmers presents a diversity of milk farmers' profiles, such as big or small, high-technological or low-technological, with high education degree or with any education level. As a consequence of this variety of distinct agents, any public policy related to the milk production faces a challenge: to make itself easy to implement and to turn in effective. However, sanitary and animal health aspects from milk production are not easy to understand. They are much technical and require a very specialized type of knowledge to be understood. (MAPA, 2011).

Many farmers cannot achieve the requirements of such regulations due to this lack of clear (i.e. easy to understand) information and to the constraints in their budget, education or access to technical assistance. Consequently, the implementation of milk-related food policy requires a support in order to be implemented equally along all agents. After various policy reforms, the coordination between the incentives and quality production demanded a change to uncover the gap between institutions and organizations. One solution with this objective was the creation of the *Conselho Paritário entre Produtores e Indústrias de Laticínios* (Conseleite) (Canziani and Guimarães, 2003, Silva et al., 2012).

Conseleite emerged after a difficult in implement the first milk policy which occurs after a long period of regulation in the Brazilian economy, the Normative Instruction 51 in 2002 (MAPA, 2002). The regulation was created to present specific parameters of animal health, sanitary in production, that is, it brings up indicators that reveal characteristics of quality and provide incentives to efficient milk production. However, as illustrated above, the rule faced barriers to be implemented. As a response, the Conseleite was founded in order to provide the needed support to translate the technical parameters of such policy.

Conseleite is a state-level organization that was created only in five of the twenty-seven Brazilian states: Paraná (2002), Rio Grande do Sul (2004), Santa Catarina (2007), Mato Grosso do Sul (2011) and Rondônia (2014). It is a structure that is formed by two equal parts in numbers of milk farmers and processors and a third part with technicians of milk market. By definition, Conseleite is a meso-institution (Ménard, 2014, 2017, 2018), because it is an intermediary level between institutions and economic agents which provides an institutionalized structure of information provision of price references based on technical indicators from the regulation and production costs in its region of establishment (Canziani and Guimarães, 2003). In other words, it regionally translates the rules efficiently. We assume the Conseleite as an efficient meso-institution because it is a structure formed by an equal participation of groups guided by a common objective - to develop the milk sector in its region. Moreover, it also follows some requirements to efficient political pressure from Becker (1983)'s model: it controls free-rider problems, it has an equal participation of involved agents, it is centered in the homogeneous objective of the agents which is maximize their trade-off between incentives and efficient production.

Additionally, despite the dependency of agents' organization in a determined location, Conseleite is not created as a function of efficiency and productivity. The foundation of such meso-institution is assumed as exogenous because it does not specifically depend on the efficient production in terms of milk quality. By that, we mean that it was not the previous efficiency in cow milk production that led to the Conseleite creation. Contrary, there were two situations. The creation of such structure occurred in Brazilian states known by their inefficiency and also in others known by their efficiency in quality production. In sum, we assume that Conseleite occurred as a result of economic organization of milk farmers and processors to better coordinate incentives to enhance milk quality.

According to Silva et al. (2012), the Conseleites' information outputs has been strongly adopted in transactions between milk farmers and dairy processing firms in the states where they operate. However, many Brazilian regions did not create such arrangement due to conflicts and the difficulties in organize representatives either in farmer or processor side. Therefore, as a consequence of the local aspect of Conseleite functioning, many agents from the states without Conseleite still kept their problems related to the minimum indicators of food safety and security from the regulation. As a response, another institutional change was demanded to support locations without that meso-institution.

The new milk policy was the Instruction 62/2011 of 29 December of 2011 (MAPA, 2011). The regulation is very similar to the first one (IN 51/2002) with some adjustments in some technical parameters, but with the same objective: keep the food safety in Brazilian milk production. Given that similarity, some of the same problems of rules' translation were maintained for some farmers, specifically those from the states without Conseleite. The translation channel of technical parameters from the regulation and the basis to form the price and to provide incentives to encourage high-quality level production continued absence, except for the states with the meso-institution.

That said, we assume that the foundation of a meso-institution does not impact in a short-term, but also in long-term. Any new policy could be better implemented and achieve success if there is an intermediate-level structure that servers as a bridge to connect the institutions (macro) and organization (micro). The function of translate policies by information provision, mainly the food ones which are usual complex, can provide continuous institutional support to implement new regulations and, then, it can bridge food policy to the success in its effectiveness.

4. DATA AND METHOD

We exploit the effect of the earlier existence of a meso-institution, namely Conseleite, in the presence of a new food policy in the Brazilian cow milk industry. Our dataset has daily milk laboratory observations from 21 of the 27 Brazilian states (Alagoas, Amazonas, Bahia, Ceará, Distrito Federal, Espírito Santo, Goiás, Maranhão, Minas Gerais, Mato Grosso do Sul, Mato Grosso, Pará, Paraíba, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Norte, Roraima, Sergipe, São Paulo, Tocantins) over a nineteen-year period (1999-2017), at the individual farmer level, totaling 13 million data points. The dataset is private in nature and contains detailed information of 471,938 agents, resulting in an average of about 27 milk samples per farmer in the whole period. However, it corresponds to an unbalanced panel set, because there are some individuals that send more milk samples than others and, also, we do not have data corresponding to all days in the covered period. Moreover, some of them also send more than once in the same day. By that, we transform the data to daily means in cases of duplication by the same agent in the same day.

The dataset consists in milk quality parameters, such as the negatively correlated with milk quality (total bacteria level and somatic cell level) and the positively correlated with milk quality (percentage of lactose, percentage of lactose and total solids). All variables are relevant for the present study because they are directly associated with the new milk policy's content. IN 62/2011 presents quality parameters and it specifically includes those indicators. Consequently, they are our outcomes of interests because they capture the impacts from the distinct effects from the new milk policy in states with and without Conseleite. Also, the dataset details the observation's location at a Brazilian state, and control variables that could influence the main interests, such as the technology applied in milk storage before sample sending (e.g. direct from the animal, milk storage tank, storage tank inside a truck, milk storage silo and others) and the scale economy capacity (if the sample comes from an individual milk farmer, a dairy processing firm, a group of milk farmers and others).

This unique field setting provide support to the application of a DiD approach. We have the treatment group (states with Conseleite), control group (states without Conseleite) and the treatment exogenous shock (public policy - IN 62/2011 in 29 December 2011). In order to evaluate the impact of the institutional change in presence of Conseleite, we exclude the state of Rondônia of our analysis, since Conseleite was created there only after the shock.

Attempting to circumvent the selection and omitted variable biases and endogeneity, we make several complementary procedures: i) handle the non-observable heterogeneity by adding time- and individual-fixed effects; ii) add state-specific time trends as a complementary mechanism of parallel trends hypothesis (Besley and Burgess, 2004); iii) test the parallel trends hypothesis; iv) perform a placebo test; and v) attend to serial correlation and heteroskedastic issues through error term clustering (Bertrand et al., 2004, Cameron et al., 2011). Additionally, we also perform a Coarsened Exact Matching (CEM henceforth) (Blackwell et al., 2009).

Following Bertrand et al. (2004), we cluster standard error by the number of states due to the possibility of serial correlation problem. However, due to the few number of states (under 50), we follow their suggestion and apply the adaptation of a panel of length 2 (before and after) ignoring the time series information. According to them, this aggregation solves this serial correlation problem even for quite small number of groups.

Additionally, strengthening our identification strategy in DiD, we perform the CEM as our matching technique to avoid the bias from the imbalance between the treatment and control group (Blackwell et al., 2009, Iacus et al., 2012). We coarsen seven variables directly correlated with the imbalance of the groups: technology, economies of scale capacity, total bacteria level, somatic cell level, percentage of lactose, percentage of protein and total solids. The first two are naturally categorical, so they remain with five and four categories, respectively. However, the lasts are continuous and, by that, we adapt them into well–defined categories. For instance, we coarsen bacteria total level in seven categories (less than 100, between 100 and 200, between 200 and 400, between 400 and 800, between 800 and 1600, between 1600 and 3200, equal or greater than 3200), somatic cell level in five categories (less than 200, between 200 and 400, between 400 and 800, between 800 and 1600, equal or greater than 1600), percentage of lactose in five categories (less than 4.4, between 4.4 and 4.5, between 4.5 and 4.6, between 4.6 and 4.7, equal or greater than 4.7), percentage of protein in six categories (less than 3.1, between 3.1 and 3.2, between 3.2 and 3.3, between 3.3 and 3.5, between 3.5 and 3.6, equal or greater than 3.6), total solids in five categories (less than 12, between 12 and 12.5, between 12.5 and 13, between 13 and 13.5, equal or greater than 13.5).

In general terms, we define this coarsen categorization based on the distribution in percentage of the data, that is, each category has at least 10% to 20% of the all observations of that variable. In doing so, we try to attenuate the imbalance as much as possible. We choose the CEM approach due to its better performing compared to more popular matching methods (Blackwell et al., 2009, Iacus et al., 2012, Beatty and Tuttle, 2014). Moreover, differently to Beatty and Tuttle (2014), we maintain all observations and weight our estimates according to the CEM outputs.

We perform our estimates based on the following equation:

$$Y_{ist} = \alpha_s + \delta_t + \varphi_{st} + c\lambda_{ist} + \Lambda I_{st} + \Lambda_t + I_s + \varepsilon_{ist} \quad (1)$$

Where Y_{ist} is the outcome of interest based on two indexes of quality for individual i in group s (state) by time t: an index of low-quality (the sum of total bacteria level and somatic cell level) and an index of high-quality (the sum of percentage of lactose, percentage of protein and total solids, which the percentages are multiplied by 100). α_s and δ_t are state- and time-fixed effects, respectively. φ_{st} is specific-time trend variable which includes an interaction dummy between all months per state in order to capture the monthly milk production seasonality. $c\lambda_{ist}$ are individual controls, specifically the aspects related to technology and economies of scale. ΛI_{st} characterizes the treatment effect by state s at time t. Λ_t is a dummy to mark the pre- (0) and pos-shock period (1). I_s identifies the treatment (1) and control groups (0). ε_{ist} is the error term.

5. RESULTS

As one of the first steps to perform a DiD analysis, we test the identification strategy of our design through the parallel trends hypothesis. Our identification strategy is a DiD procedure that adopts the new food policy (IN 62/2011) related to milk quality as the treatment, and compares the difference of its effectiveness through an institutional background which assumes that meso-institutions can uncover the gap between institutions and organizations. The validity of the empirical strategy is justified by the assumption that Brazilian states with such structure (i.e. Conseleite) can better absorb the regulation than the others without it because they have an additional translation mechanism. Figure 1 presents this relevant assumption graphically. Following Aragón and Rud (2013), it plots the conditional means of the indexes of low-quality and high-quality, respectively. Both means are conditional on technology of milk storage, scale economy capacity, state-, time- and specific time-trend fixed effects.

Figure 1 suggests that both treatment and control groups behave similarly before the new milk policy IN 62 of 29 December 2011. As expected, the graph shows that after the treatment effect those Brazilian states with Conseleite appear with a trend of decreasing of the index of low-quality, demonstrating that they have a higher level of policy effectiveness due to this achievement of high-quality of milk production. Also, the index of high-quality which represents a positive correlation with milk quality exposes an increasing for the treatment group while the control states present a decreasing, as expected. In general words, the identification strategy illustrates the earlier existence of a meso-institution improves the effectiveness of a new food policy due to the function of rules' translation from such structure.

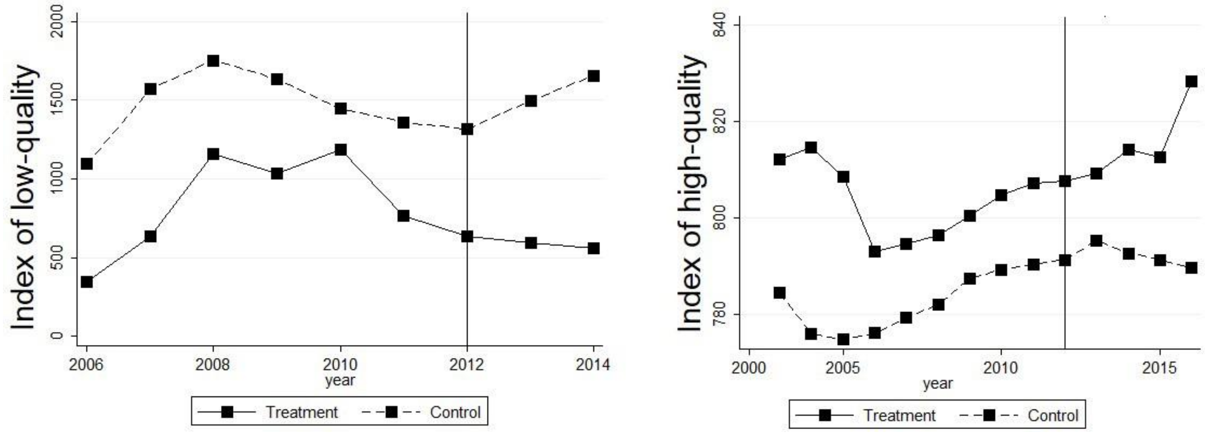

Figure 1: Parallel trends

Table 1 reports the descriptive statistics for interest variables for both treatment and control groups in the pre-period of treatment (IN 62 of December 29, 2011).

Table 1: Descriptive Statistics – Pre-Period of IN 62/2011

VARIABLE	Treatment Group	Control Group	Total Sample
Index of low-quality	1,601.85	1,512.98	1,523.27
	(1,459.42)	(1,480.88)	(1,478.68)
	[14,490]	[110,589]	[125,079]
Index of high-quality	777.58	784.80	784.16
	(33.81)	(41.89)	(41.29)
	[17,519]	[180,478]	[197,997]

Notes: (a) Overall means. (b) Standard errors are reported in parentheses.
(c) Number of observations is reported in brackets.

Columns 2 and 3 display the summary statistics for treatment and control group, respectively. The last column reports the results for total sample before the treatment effect of the new food policy. Besides that, based on Figure 1, we do not perform a test of difference of means, because the parallel trends demonstrate that both groups, even with similar trend before treatment effect, have clearly distinct averages.

Table 2 displays the DiD estimates according to Equation 1. It uses the corrected sample which considers serial-correlation issues and matching weights.[1] Models 1 to 6 have the index of low-quality as dependent variable. Models 7 to 12 are focused on the index of high-quality. Firstly, second column exposes the estimates with any control variable. In sequence, we progressively add our covariate controls. Third column presents the estimates with state-fixed effects. Fourth column corresponds to the results also considering technology dummies. Fifth column insert dummies which capture scale effects. Sixth column contains time-fixed effects either. Finally, seventh column includes a set of state-specific time trends.

[1] In order to contest the heteroskedasticity issue, we also perform all estimates clustering standard errors by individuals, since the cluster procedure in groups also may bring a downwards bias to the standard errors (Cameron et al., 2011). The results are robust

Table 2: Effects of meso-institution presence on new food policy

VARIABLE	(1) Index of low-quality	(2) Index of low-quality	(3) Index of low-quality	(4) Index of low-quality	(5) Index of low-quality	(6) Index of low-quality
DiD Coefficient (ΛI_{st})	-44.91	-41.58	-36.95	-36.99	-54.39	-100.28***
	(48.04)	(47.82)	(47.67)	(47.68)	(39.83)	(31.47)
Treatment effect dummy (Λ_t)	43.89***	44.28***	34.22**	34.25**	-50.26	-35.35
	(16.27)	(16.75)	(15.67)	(15.67)	(122.11)	(122.21)
Treatment group dummy (I_s)	-73.37	-1.92e+08	-	-	8.12e+07	2.79e+08
	(49.07)	(1.81e+12)			(4.81e+11)	(1.47e+11)
State Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Technology Fixed Effects	No	No	Yes	Yes	Yes	Yes
Scale Fixed Effects	No	No	No	Yes	Yes	Yes
Time fixed effects	No	No	No	No	Yes	Yes
Time trends	No	No	No	No	No	Yes
Observations	76,914	76,906	76,906	76,906	76,904	76,888
Adjusted R-squared	0.4512	0.4559	0.4594	0.4594	0.4641	0.4657
VARIABLE	(7) Index of high-quality	(8) Index of high-quality	(9) Index of high-quality	(10) Index of high-quality	(11) Index of high-quality	(12) Index of high-quality
DiD Coefficient (ΛI_{st})	1.60*	1.75*	1.71*	1.71*	1.65**	1.44*
	(0.87)	(0.90)	(0.89)	(0.89)	(0.82)	(0.78)
Treatment effect dummy (Λ_t)	3.87****	3.82****	3.91****	3.89****	3.14	2.89
	(0.23)	(0.23)	(0.23)	(0.23)	(3.58)	(3.49)
Treatment group dummy (I_s)	-0.94	7.76e+04	6.31e+06	-2.58e+07	2.06e+07	-2.86e+06
	(0.88)	(5.88e+09)	(6.74e+09)	(1.42e+10)	(1.18e+10)	(2.44e+09)
State Fixed Effects	No	Yes	Yes	Yes	Yes	Yes
Technology Fixed Effects	No	No	Yes	Yes	Yes	Yes
Scale Fixed Effects	No	No	No	Yes	Yes	Yes
Time fixed effects	No	No	No	No	Yes	Yes
Time trends	No	No	No	No	No	Yes
Observations	123,766	123,764	123,764	123,764	123,764	123,720
Adjusted R-squared	0.3390	0.3397	0.3404	0.3406	0.3456	0.3478

Notes: (a) Standard errors are reported in parentheses and clustered by an interactive variable between states and months. number of states. (b) "-" means omitted due to multicolinearity. (c) "State Fixed Effects" represents a set of dummies for each state. (d) "Technology Fixed Effects" is a set of dummies related to the equipment used in milk storage before sample sending (cow, milk silo, milk storage tank, storage tank inside a truck, others). (e) "Scale Fixed Effects" corresponds to a set of dummies related to the category of the agent responsible for that sample (e.g. individual milk farmer, collective farmers, dairy processing firm, others). (f) "Time Fixed Effects" is a set of dummies for each day of a month (1,2,3,4,...), 12 months of each year, 19 years of sample period range (1999-2017). (g) "Time trends" represents a time trend variable for each state over all possible months for control and treatment groups. (h) Statistical significance: * $p<0.1$, ** $p<0.05$, *** $p<0.01$, **** $p<0.001$.

All estimates support robustness in the results. It suggests that the presence of a meso-institution boost the effectiveness of a new food policy. Moreover, it highlights the heterogeneity of policy outcomes due to the presence or not of an intermediate institutional structure responsible for implementation. Based on Ménard (2014, 2017), it illustrates the relevance of an intermediate-level institution that translates the general aspects to a specific context serving as a bridge between institutions and organizations. The both extremes macro- and micro-levels can need a support to connect themselves depending on the case.

The meso-institution plays this role. In our case, we empirically observe that a new food policy about milk quality which carries complex content is more effectively implemented in locations where meso-institutions act and provide translation structure through simplification of technical indicators and market signalization of incentives based on price references. Moreover, we also present that the creation of meso-institution has long-term impacts in the generation of new public policies if it maintains its functions working efficiently. We advocate it because the creation of such structures occurred years before the new policy. And even that, they still continue to impact the rules implementation.

Our results highlight that a new policy can bring different outcomes even inside a same institutional environment and considering similar organizations. We present it through a design that captures the influence of a specific meso-institution (Conseleite) boosting the policy implementation to the agents under its targeted area in comparison to the agents which it is not. This finding corroborates to the perspective that the translation of institutions is quite relevant in some cases, especially on those that regulations are surrounded by complexity or ambiguity. We also evidence that the impacts of meso-institutions can be sustained over time bringing long-term benefits to further policies after the meso-institution creation.

We shed some light in the interplay between New Institutional Economics and public policy analysis by: i) argue that explanations oriented by traditional arguments about agents' characteristics (e.g. economies of scale and access to technologies) are not sufficient to explain problems in food policy implementation (Van Tongeren, 2008); ii) illustrate that when the translation of rules' complexity faces obstacles the institutional economics approach can provide support (Hassanein, 2011, Ragasa et al., 2015, Saint Ville et al., 2017); iii) expose that even national food policy should take into account the different levels of the inserted institutional arrangement, such as federal, regional, local (Hedley, 2017, Jayne et al., 2018) and, by that, we contribute to the literature by show empirical evidences that the institution cannot be seen as uni-, but multidimensional.

5.1 Sensitivity analysis

In the previous section, econometrics estimations underlined the meso-institution's role in food policy. However, we also bring a sensitivity analysis to emphasize the robustness of our results. We perform three different approaches: the first containing the placebo tests, the second with a robustness check in which we test if the results are sensitive to other alternative samples and a third in which we present complementary findings.

5.1.1 Placebo tests

We perform placebo tests changing the treatment effect (December 29, 2011) to other periods. We chose the years of 2008 and 2010 to apply those tests because they represent notable periods to the Brazilian cow milk industry, but also equally influential for both treatment and control groups. The first represents the global economic crisis which affected directly the milk economy in Brazil due to imports and exports. The second is associated with an internal shock that also impacted the sector due to changes in the functioning of the economy of the country, the Brazilian presidential election of 2010.[3] It is expected to do not find the same results of our main specification.

Table 3 shows the estimates with both dependent variables indexes of low-quality and high-quality in both placebo periods 2008 and 2010.

Table 3 displays interest findings[2]. We find no difference in both placebo tests in the analysis of the index of high-quality. However, we evidence an intriguing difference in the investigation of the index of low-quality. These results indicate that there was an opposite scenario before the original treatment effect. It emphasizes the effect of the meso-institution facing a new food policy and strengthens our arguments. Before the new food policy of milk quality, the treatment group had worst quality in terms of the index of low-quality (total bacteria level and somatic cells level), but it strongly changes to the other side when the real effect occurs. Indeed, these estimates underline our expectations of presence of a specific meso-institution.

We provide a data-driven argument to empirically test the recent stream known as the new research frontier to the New Institutional Economics and public policy analysis, the meso-institution (Ménard, 2018). We stress the initial theoretical developments from Ménard (2014)

[2] Our placebo design excludes contaminated data from treatment states after treatment effect.

Table 3: Placebo test: distinct shock periods

VARIABLE	(1) 2008 Index of low-quality	(2) 2008 Index of high-quality	(3) 2010 Index of low-quality	(4) 2010 Index of high-quality
DiD Coefficient (ΛI_{st})	136.808	-0.75	163.77	-4.76
	(214.47)	(5.92)	(189.02)	(5.29)
Treatment effect dummy (Λ_t)	-	-	-	-
Treatment group dummy (I_s)	-4.94e+09	-6.04e+07	-5.02e+09	-5.95e+07
	(2.29e+12)	(1.15e+10)	(2.28e+12)	(1.14e+10)
State Fixed Effects	Yes	Yes	Yes	Yes
Technology Fixed Effects	Yes	Yes	Yes	Yes
Scale Fixed Effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Time trends	Yes	Yes	Yes	Yes
Observations	69,338	113,348	69,338	113,348
Adjusted R-squared	0.4732	0.3438	0.4732	0.3438

Notes: (a) Standard errors are reported in parentheses and clustered by an interactive variable between states and months. (b) "-" means omitted due to multicolinearity. (c) "State Fixed Effects" represents a set of dummies for each state. (d) "Technology Fixed Effects" is a set of dummies related to the equipment used in milk storage before sample sending (cow, milk silo, milk storage tank, storage tank inside a truck, others). (e) "Scale Fixed Effects" corresponds to a set of dummies related to the category of the agent responsible for that sample (e.g. individual milk farmer, collective farmers, dairy processing firm, others). (f) "Time Fixed Effects" is a set of dummies for each day of a month (1,2,3,4,...), 12 months of each year, 19 years of sample period range (1999-2017). (g) "Time trends" represents a time trend variable for each state over all possible months for control and treatment groups. (h) Statistical significance: * p<0.1, ** p<0.05, *** p<0.01,
**** p<0.001.

and contribute to the dimensionalizing institutions movement. Also, we advance putting quantitative empirical analysis into the findings from the descriptive studies of Ménard (2017) and Rouviere and Royer (2017). In conclusion, we illustrate meso-institutions as relevant mechanism in public policy implementation not only as short-term influential, but also impacting in long-term.

5.1.2 Robustness checks

We try to consolidate our counterintuitive focus by testing if the traditional arguments of technology and size (economies of scale) come first, or not, of the institutional concern. In doing so, we verify if our results are sensitive to alternative sample definitions, specifically one related to technology and another with size. We perform the same specification (Equation 1) but now in those two distinct subsamples.

First, we test if the results are maintained when the individuals are related to the same size in terms of economies of scale. By that, we analyze if the presence of meso-instutions affect the food policy implementation among dairy processor firms differently. In other words, if agents with a similar economies of scale capacity have difference outcomes related to milk quality due to the translation of the complex rules from the meso-institution. Based on the theory, it was expected that they should have similar results. Although, we argue the opposite due to the influences from the institutional context.

Second, we apply the same procedures focusing on the influence in a same technological platform: when the observations come from a specific tank which storage milk following particular conditions. It is expected that the given the similarity in technology, the food policy should be similarly implemented. However, we argue that even under those conditions, the meso-institution role affect the agents' performance.

Table 4 reports the estimations considering the specific subsamples with a similar capacity of economies of scale and technological structure.

Table 4: Robustness checks in sub-samples

VARIABLE	(1) [Only processors - scale] Index of low-quality	(2) [Only processors - scale] Index of high-quality	(3) [Storage in tank - technology] Index of low-quality	(4) [Storage in tank - technology] Index of high-quality
DiD Coefficient (ΛI_{st})	-103.30***	3.05****	-88.98***	2.84****
	(31.54)	(0.75)	(32.03)	(0.75)
Treatment effect dummy (Λ_t)	-34.87	3.47	-32.93	3.17
	(123.21)	(3.86)	(125.65)	(3.88)
Treatment group dummy (I_s)	4.27e+06	-1.86e+05	-1.52e+07	5.97e+04
	(1.24e+11)	(1.92e+09)	(1.94e+11)	(2.20e+09)
State Fixed Effects	Yes	Yes	Yes	Yes
Technology Fixed Effects	Yes	Yes	Yes	Yes
Scale Fixed Effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Time trends	Yes	Yes	Yes	Yes
Observations	76,518	76,716	73,240	73,806
Adjusted R-squared	0.4711	0.5099	0.4687	0.5045

Notes: (a) Standard errors are reported in parentheses and clustered by an interactive variable between states and months. (b) "-" means omitted due to multicolinearity. (c) "State Fixed Effects" represents a set of dummies for each state. (d) "Technology Fixed Effects" is a set of dummies related to the equipment used in milk storage before sample sending (cow, milk silo, milk storage tank, storage tank inside a truck, others). (e) "Scale Fixed Effects" corresponds to a set of dummies related to the category of the agent responsible for that sample (e.g. individual milk farmer, collective farmers, dairy processing firm, others). (f) "Time Fixed Effects" is a set of dummies for each day of a month (1,2,3,4,...), 12 months of each year, 19 years of sample period range (1999-2017). (g) "Time trends" represents a time trend variable for each state over all possible months for control and treatment groups. (h) Statistical significance: * p<0.1, ** p<0.05, *** p<0.01, **** p<0.001.

Table 4 guides to the argument that, given similar size and technology conditions, the institutional differences influence the food policy implementation. We evidence that, even considering size and technology as equal, the earlier presence of the meso-institution is relevant to policy progress. Agents from the same capacity of economies of scale and technological structure are impacted by a food policy distinctly due to the intermediate-level institution's translation. It emphasizes that, even being those traditional aspects relevant, the agents need to initially figure out the policy to then make further size- or technology-related decisions.

We stake that meso-institution is a key driver to the success of a food policy. Technologies and size are relevant to handle food security and safety issues, but the meso-institutions cannot be forgotten.

5.1.3 Complementary results

On the one hand, we argue that the meso-institution comes before the technology and size concerns in terms of food policy implementation. On the other hand, we emphasize that they are still relevant. We believe that the effects from the economies of scale and technologies can emerge as second-order benefits from the policy implement. In other words, given that the agents have the same scenario of translation of rules due to the presence of the meso-institution (first-order benefits), they adapt themselves distinctly according to their differences in size and technology (second-order benefits). We analyze it through an interactive variable between the DiD coefficient, that is, we combine the distinguished agents with influence from the meso-institution with variables that represent size and technology levels. Similar to our design of the robustness checks, we perform models with variables which identifies the capacity of economies of scale from dairy processor firms, and the high technology level of milk storage through the specific equipment tank.

Table 5 presents the analysis of these second-order benefits.

Table 5: Second-order effects

VARIABLE	(1) [Economies of scale effects] Index of low-quality	(2) [Economies of scale - effects] Index of high-quality	(3) [Technology effects] Index of low-quality	(4) [Technology effects] Index of high-quality
DiD Coefficient (ΛI_{st})	620.65	-0.029	-565.97	0.36
	(416.46)	(2.92)	(375.56)	(2.87)
DiD Coefficient * Dairy processing firm	-724.10*	2.07		
	(408.97)	(2.93)		
DiD Coefficient * Milk storage tank			472.38	1.29
			(377.24)	(2.90)
Treatment effect dummy (Λ_t)	-35.33	2.89	-35.48	2.89
	(122.24)	(3.50)	(122.15)	(3.49)
Treatment group dummy (I_s)	2.75e+08	-2.63e+06	2.84e+08	-2.73e+06
	(1.47e+11)	(2.43e+09)	(1.47e+11)	(2.44e+09)
State Fixed Effects	Yes	Yes	Yes	Yes
Technology Fixed Effects	Yes	Yes	Yes	Yes
Scale Fixed Effects	Yes	Yes	Yes	Yes
Time fixed effects	Yes	Yes	Yes	Yes
Time trends	Yes	Yes	Yes	Yes
Observations	76,888	123,720	76,888	123,720
Adjusted R-squared	0.4657	0.3479	0.4657	0.3478

VARIABLE	(5) [Joint effects of scale and technology] Index of low-quality	(6) [Joint effects of scale and technology] Index of high-quality
DiD Coefficient (ΛI_{st})	624.75	-0.12
	(416.46)	(2.94)
DiD Coefficient * Dairy processing firm	-2,148.90****	11.95***
	(495.16)	(4.43)
DiD Coefficient * Milk storage tank	1,434.77****	-10.14**
	(240.90)	(4.43)
Treatment effect dummy (Λ_t)	-35.77	2.89
	(122.08)	(3.49)
Treatment group dummy (I_s)	2.83e+08	-2.54
	(1.47e+11)	(2.44e+09)
State Fixed Effects	Yes	Yes
Technology Fixed Effects	Yes	Yes
Scale Fixed Effects	Yes	Yes
Time fixed effects	Yes	Yes
Time trends	Yes	Yes
Observations	76,888	123,720
Adjusted R-squared	0.4660	0.3479

Notes: (a) Standard errors are reported in parentheses and clustered by an interactive variable between states and months. (b) "-" means omitted due to multicolinearity. (c) "State Fixed Effects" represents a set of dummies for each state. (d) "Technology Fixed Effects" is a set of dummies related to the equipment used in milk storage before sample sending (cow, milk silo, milk storage tank, storage tank inside a truck, others). (e) "Scale Fixed Effects" corresponds to a set of dummies related to the category of the agent responsible for that sample (e.g. individual milk farmer, collective farmers, dairy processing firm, others). (f) "Time Fixed Effects" is a set of dummies for each day of a month (1,2,3,4,...), 12 months of each year, 19 years of sample period range (1999-2017). (g) "Time trends" represents a time trend variable for each state over all possible months for control and treatment groups. (h) Statistical significance: * p<0.1, ** p<0.05, *** p<0.01, **** p<0.001.

Models 1 and 2 focus on the second-order effects from economies of scale when they are analyzed separately. They illustrate that this capacity is able to diminish the index of low-quality, that is, it enables better adaption to the food policy through those agents that have access to a distinguished structure, such as financial resources. Models 3 and 4 investigate the second-order influence from the technology. They do not show any results. In contrast, Models 5 and 6 bring interesting results from the analysis of the joint effects of both influences of size and technology. They underline that the size has positive effects by decreasing the parameters of low-quality and by increasing the indicators of high-quality from the implemented food policy. However, they evidence that the second-order technological effects in the joint scenario of size and technology contradict the expectation. The results indicate that, given the same level of rules' translation (meso-institution) and the presence of high capacity of economies of scale, the decisions of technology can drive to failures in of a policy because the agents can test new technologies (uncertainty ones) more often than the others.

5.2 Theoretical implications

Our study contributes to the theory of meso-institutions introducing alternative mechanisms to handle implementation failures in food policy. We posit that introduction of a new policy occur in, at least, two distinct stages, which we call first- and second-order effects. By first-order effect we mean that there is a function of translation which has to be accomplished before this implementation. The agents require a minimum knowledge and understanding about the regulation in order to adapt themselves and make the correct decisions in the second-order stage. In sequence, we bring that this second part, the idiosyncrasies of each individual, takes place again through the technology choices and the benefits from the capacity of economies of scale. Thus, we uncover that to translate a policy in a general manner is the first step in its implementation and, then, the monitoring and enforcement should emerge aiming to control if the agents' choices are following the requirements. In sum, we illustrate that the institutions (i.e. policy) should be dimensionalized (macro-, meso- and micro-) and analyzed under a sequential logic (first- and second-order effects).

Our theorizing advances in the literature of meso-institution (Ménard, 2014, 2018). We bring empirical evidences to this recent stream which is mainly surrounded by descriptive approaches (Ménard, 2017, Rouviere and Royer, 2017). In addition, we also evidence that meso-institution does not have only short-term impacts in terms of food policy effectiveness due to its creation, but the meso-institution also has long-term consequences for further policies when it was already established. Instead of maintain the traditional explanations about technology and size, we emphasize the relevance of the institutional background behind food policy.

We shed some light on the fact that implementation failures can also be consequences of asymmetric information from the rules' complexity. Agents who do not absorb the technical content from the policy or do not know where they can look for support do not implement the policy. They can need an adequate translation structure to adapt their production system due to the absence of specialized knowledge about the policy.

Analogue to the why nations fail argument (Acemoglu and Robinson, 2013), our results underline that food policy fails when institutions fail. However, we illustrate that the institutions should be not only considered through a macro-level, but also through a meso-level. There is a relevant gap between institutions and organizations which we cover here by the meso-institutions through their function of translate rules. Consequently, the structure of how the political structure of a nation is based also matters (Hedley, 2017). Any policy should take into account to the political organization of its environment. For instance, if the translation, implementation and monitoring will be performed by a national-, regional- or local-level (e.g. country, states, municipalities).

Overall, we expose that institutional changes flow more efficiently in locations with meso-institution than in others without them. In other words, before to strictly consider a policy as implemented or able to be monitored, a mechanism of translation should appear to enable the agents to figure out the content of the policy. This finding can lead to a new agenda wherein scholars can study not only challenges of food security (Barrett, 2010, Godfray et al., 2010, FAO et al., 2017), but also other inequality-related societal problems, such as poverty and health.

5.3 Managerial implications

Beyond the theoretical contributions, we also bring relevant implications for practice. Similar to the very specialized regulation behind infrastructures services (e.g. water, electricity, etc.), the food policy usually carries much complexity and technicality to achieve food safety. By that, as the public utility case, alternative arrangements in the intermediate-level should follow the implementation of such policies. Like regulatory agencies, those structures should provide a clear translation, enforcement and monitoring of the rules, covering the gap between institutions and organizations and acting as a meso-institution.

The nature and focus of the meso-institution is guided by the food policy. The policy that will guide if it requires more attention in the translation, if it has a much technical content or if the agents has no access to specialized services of translation such as specific service providers of consulting, or in the enforcement and monitoring if the affected agents is widespread located or it is possible to apply punish mechanisms easily. It is possible to evidence some examples of this kind of institutional structure. For instance, the Canadian Marketing Boards (Veeman, 1997, Tamilia and Charlebois, 2007, Royer, 2011), the United Soybean Board in the United States (Williams et al., 2014), the European Milk Board (Commission, 2014), the Brazilian cases of the Consecana and Consecitrus (Belik et al., 2012).

In Brazil, the states which would like to create the Conseleite should follow some guidelines. They should approximate the both sides of the transaction of milk supply the milk farmers and processors - and provide an external third part formed by technicians specialized in dairy market. However, the main difficult is to convince representative agents of both sides to follow the directions made inside Conseleite. Thus, the creation of such structure depends on the market organization. They basis on agents' agreement in adopt a common structure (Conseleite) which will provide price references (information) to guide incentives according to the milk quality levels.

If created, the structure acts as follows. The third part (technicians) will be supplied by information of regional production costs directly from the involved agents (milk farmers and processors) and also from the public information from market. They use a specific methodology of price formation based on the production costs in that state and the specific parameters of milk quality from the regulation: total bacteria level, somatic cell level, percentage of lactose, percentage of protein and total solids. They make the calculations and present them in a monthly meeting that is documented by five representative agents from each parties, the farm and processing (Canziani and Guimarães, 2003).

In conclusion, the creation of such mechanism depends on the level of conflicts in the sector. To found that the involved agents have to be aiming to reduce the asymmetric information in the transaction, as well as concern with the industry development in a more fairness manner. The development of this arrangement, due to its difference of the high-regulated mechanism such as regulatory agencies, assumes some characteristics of collective actions (Olson, 2009).

6. CONCLUSION

We support our hypothesis that the earlier existence of a meso-institution increases the efficiency of a new food policy implementation. We analyze that a new national food policy about milk quality (IN 62/2011) was more efficiently implemented in Brazilian states with the presence of Conseleite than the others. These findings rely on the fact that those regions have an additional translation mechanism that boost the effectiveness of the regulation. Such locations presented better levels of quality in the parameters related to the new regulation due to the Conseleite's support in implementation.

This intermediate-level ("meso") institution covers the gap between the rules (i.e. institutions, "macro") and milk farmers and processors (i.e. organizations, "micro"). It provides information through regional price references based on milk policy's content which are adopted in transactions of milk supply. Additionally to the regulation, it introduces production costs to make the price more realistic to that location. In other words, the Conseleite translates IN 62/2011 into price through the provision of information (monthly documents and meetings), making the content of the regulation easier to the organizations figure out.

The results reported in this study indicate that the earlier presence of Conseleite resulted in the decreasing of bacteria and somatic cell level when IN 62/2011 emerged. They also illustrate the increasing of the percentage of lactose, percentage of protein and total solids. The paper emphasizes that these impacts can be called as firs-order effects. While the influence from technology and capacity to generate economies of scale as second-order effects. By that, we advocate that the food policy implementation should consider a sequential logic in which the institution come first and, then, the influence from technology and size appears. It illustrates that, even inside a same technological platform or internal structure, the organizations are differently impacted by the policy due to function of translation of the meso-institution.

We bring contributions for theory and practice by provide alternative arguments to explain the problems in food policy implementation. This design can support policy-makers in the implementation of new policies about other societal problems, such as poverty and health.

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