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## Aligning enforcement and governance mechanisms to protect and govern food products with a protected designation of origin

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### **Abstract:**

*The quest for appropriate governance and enforcement mechanisms in niche food products with a protected designation of origin is increasingly receiving attention as more and more food products are differentiated based on their regional identity and reputation. The general consensus is that if public certification bodies adequately instil consumer confidence in these products, then market like mechanisms will be the most effective governance mode. However, if public certification bodies are insufficient, market like mechanisms seize to be effective, and alternative modes are required to protect the interests of consumers adequately. This paper therefore aims to make an empirical contribution by investigating the enforcement and governance mechanisms required to protect and govern a regional food product when public certification fails. As one of the recent additions to South Africa's repertoire of products with a designated origin, Karoo Lamb made for an interesting case study. This investigation is based on survey data and a conjoint experiment among 73 farmers, five abattoirs, two processors/packers and five retail outlets. The results indicate that, due to its failed public certification body, Karoo Lamb is better off being governed by a hierarchical arrangement which allows for a stronger focus on continuous monitoring, and private enforcement mechanisms.*

*Acknowledgment: The Red Meat Research and Development SA and the Bill and Melinda Gates Foundation for their financial support.*

**JEL Codes:** L22, Q12

#1420



# **Aligning enforcement and governance mechanisms to protect and govern food products with a protected designation of origin**

## **Abstract**

The quest for appropriate governance and enforcement mechanisms in niche food products with a protected designation of origin is increasingly receiving attention as more and more food products are differentiated based on their regional identity and reputation. The general consensus is that if public certification bodies adequately instil consumer confidence in these products, then market like mechanisms will be the most effective governance mode. However, if public certification bodies are insufficient, market like mechanisms cease to be effective, and alternative modes are required to protect the interests of consumers adequately. This paper therefore aims to make an empirical contribution by investigating the enforcement and governance mechanisms required to protect and govern a regional food product when public certification fails. As one of the recent additions to South Africa's repertoire of products with a designated origin, Karoo Lamb made for an interesting case study. This investigation is based on survey data and a conjoint experiment among 73 farmers, five abattoirs, two processors/packers and five retail outlets. The results indicate that, due to its failed public certification body, Karoo Lamb is better off being governed by a hierarchical arrangement which allows for a stronger focus on continuous monitoring, and private enforcement mechanisms.

**Keywords:** enforcement; governance; conjoint experiment; Karoo Lamb

## **1. Introduction**

According to Williamson's (1985) discrete alignment principle, (Ménard and Shirley, 2005), "calculative agents operating in a competitive environment will adopt the mode of organization [governance mechanism] that fits comparatively better with the attributes of the transaction at stake." The governance mechanisms selected to coordinate a supply chain will, therefore, depend on the degree to which the transaction attributes matter, and on the extent to which opportunism and other contractual hazards are present (Hobbs & Young, 2000). In

an attempt to limit the impact of quality management systems on transaction costs, the use of different governance mechanisms is proposed (Williamson, 1991).

Governance mechanisms (also known as governance structures or contracts) are typically clustered into three main types; market governance, hybrid governance, and hierarchical governance forms (for a detailed review, see Gellynck & Molnár, 2009). In addition to market and hierarchical governance, Gellynck and Molnár (2009) also included; non-contractual relationships (relational contracts) with non-qualified partners, non-contractual relationships (relational contracts) with qualified partners, contractual relationships (formal contracts), relation-based alliances, and equity-based alliances in their typology.

According to Raynaud et al. (2005), brands, where consumer confidence is supported by reputational capital (by means of collective enforcement), are likely to be governed by hierarchical mechanisms. On the other hand, brands, where the source of credibility is public certification, are likely to be governed by market-like mechanisms. Relevant to this study and in line with the findings of Raynaud et al. (2005), Wever et al. (2010) found that publically supported enforcement mechanisms do not need hierarchical governance mechanisms. Wever et al. (2010) went further to highlight the vital link between the governance and enforcement mechanisms for the success of food supply chains. According to Wever et al. (2010), a misalignment between enforcement and governance mechanisms might not only lead to inefficient enforcement because of higher transaction costs but also to inferior final products.

This paper investigates the dilemma of finding the appropriate mechanisms that are required to protect, and optimally govern, a typical food product linked to a specific geographical region namely lamb produced in the semi-arid Karoo region of South Africa. The paper builds on the work done by Raynaud et al. (2005) and Wever et al. (2010) through an empirical investigation of the governance mechanisms in this niche supply chain of Karoo Lamb, which recently achieved Geographical Indication (GI) status in South Africa and in the European Union. The paper, therefore, seeks to understand how stakeholder compliance with the rules and regulations of the Karoo Lamb product should be enforced, and how the supply chain should be governed. Following this evaluation, the paper aims to recommend alternative governance and enforcement mechanisms to protect, and optimally govern the Karoo Lamb supply chain.

## 2. Background to the Karoo Lamb case

The exceptional quality and unique taste<sup>1</sup> of lamb produced in the Karoo region<sup>2</sup> of South Africa has been part of the South African heritage for as long as there have been farmers in the Karoo region. The assumed quality of the lamb products from the Karoo region means that the Karoo name has considerable value and significant marketing potential waiting to be tapped into. It is precisely this potential that makes the Karoo name much sought after, even by retailers, butcheries and restaurants with little or no link to the Karoo region (Kirsten et al., 2008).

Driven by an increased concern over the misappropriation of the words “Karoo Lamb”, the Karoo Lamb producers had collectively taken the initiative to register the Karoo Meat of Origin certification mark under existing trademark laws in South Africa in 2011. The Karoo Meat of Origin certification scheme (the certification scheme) seeks to guarantee that the lamb product originates from the Karoo region, is raised under free-range conditions with good animal practices in mind, without the provision of routine antibiotics and hormones, and is supported by a full farm-to-fork traceability system (KMOO, 2016a).

Since the establishment of the Karoo Lamb certification scheme, 209 Karoo farmers (farming on about two million hectares) have been certified. Further down the supply chain, five abattoirs, four processors and/or packers, 17 butcheries and one retail chain are certified to use the certification mark. The standards and requirements that participating stakeholders need to adhere to are summarised in Table 1.

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<sup>1</sup> The lamb graze on different species of wild herbs that provide a distinct taste to the meat.

<sup>2</sup> Flat semi-arid area with dry shrubland stretching north-eastwards from the Cape (typically far from urban areas) and covers approximately 50 % of the total area of South Africa (Le Roux, Kotzé & Glen, in Kirsten et al., 2008).

**Table 1: Karoo Meat of Origin standards and requirements**

<b>Stakeholder</b>	<b>Karoo Meat of Origin standards and requirements</b>
<b>Farmer</b>	<ul style="list-style-type: none"> <li>• At least two of the six<sup>3</sup> Karoo shrub species should be present on at least 60 % of the farm area.</li> <li>• Pastures should be well managed to prevent overgrazing and camps should be fenced.</li> <li>• Adherence to the Code of Practice of Good Stockmanship, Animal Welfare Practice, and the Animal Protection Act (Act 71 of 1962).</li> <li>• Sheep should feed freely from indigenous Karoo veldt, roam freely in sizable camps, and have access to clean cold and fresh water.</li> <li>• The occasional use of supplementary feed is allowed within reasonable measure.</li> <li>• When sheep are transported, trucks should not be overloaded and should be free from any hazards.</li> <li>• Movement of animals to abattoirs or between farms should be recorded.</li> <li>• Sheep carcasses of class A, AB, B and C, fat classes 1 to 6, and carcass conformation 3 to 5 qualify for certification as Karoo Meat of Origin.</li> </ul>
<b>Abattoir</b>	<ul style="list-style-type: none"> <li>• Should be a sheep-slaughtering abattoir in the Karoo.</li> <li>• Should be registered with the South African Red Meat Abattoir Association.</li> <li>• Traceability systems should be in place that is able to trace the carcass back to the farm of origin.</li> <li>• Carcasses should be safe, of consistent high quality, and should meet all legal requirements as set out by South African law.</li> </ul>
<b>Processor/ Packer/ Retailer</b>	<ul style="list-style-type: none"> <li>• Not limited to the Karoo region.</li> <li>• Should comply with the Food Premises Regulation.</li> <li>• Products should be safe, hygienically processed, of consistent high quality, and should meet all legal requirements as set out by South African law.</li> <li>• Traceability systems should be in place that is able to trace the carcass back to the slaughtering abattoir and processing plant as well as the farm of origin.</li> <li>• The registered Karoo Meat of Origin label should be accurately applied to the packaging.</li> </ul>

Source: KMOO, 2016a

The success of Karoo Lamb, therefore, relies on efficient monitoring mechanisms for every transaction in the supply chain, to ultimately ensure the quality and origin of the final product in order to realize a price premium. This is particularly important when asymmetric information on the quality and origin of the product exists. A State-appointed third party is responsible for the enforcement of the quality and origin standards by monitoring the supply chain stakeholders for compliance with the standards and requirements which are set out in Table 1.

Generally, the use of State-appointed assignees is, in principle, a sound way of efficiently managing quality and origin standards. However, because the budget allocated for the enforcement of these regulations falls short, the State depends on members of the collective (farmers, abattoirs, processors and/or packers, and retail outlets) to pay the assignee to

<sup>3</sup> The six Karoo plant species are: *Plinthus karrooicus*, *Pentzia spinescens*, *Eriocephalus ericoides*, *Salsola glabrescens*, *Pentzia incana* and *Pieronnia glauca/rosenia humilis* (Kirsten et al., 2008).

enforce the quality and origin standards. The problem with this arrangement lies in the incentive structure. By making the supply chain stakeholders responsible for providing the enforcement incentive, the assignees are incentivized to do ‘light’ inspections in order to retain their clients (and their financial stability), as opposed to strict monitoring. This ‘light’ monitoring means that consumers, still, have no absolute guarantee of the quality and origin of the particular product. The same situation holds true for the Karoo Lamb supply chain.

According to Du Plessis and Du Rand (2012), South African consumers regard price as the most important attribute, followed by food safety, quality, and then origin when it comes to Karoo Lamb. This means that in addition to light monitoring the State is incentivized to protect those food attributes that are important to consumers, namely food safety and quality. Since food safety and quality problems mainly arise after the farm gate, the enforcement of these attributes mainly occurs at the abattoir and processing stages. Additionally, widely dispersed farmers are often overlooked because of the budgetary constraints. The system, therefore, seems to be geared to prevent food safety risks and only ensure quality after the farm gate, without much concern for the product’s origin.

According to Raynaud et al. (2005), supply chains of products with a protected designation of origin (PDO brands), where consumer confidence is supported by public certification, is likely to be governed by market-like mechanisms. This analogy is investigated in more detail by examining how the mechanisms that enforce compliance with the quality and origin standards of Karoo Lamb are aligned with the mechanisms that govern the supply chain.

### **3. Methodology**

In order to understand the governance and enforcement mechanisms that govern the Karoo Lamb supply chain, data was collected from various supply chain stakeholders. During June and July of 2015, 73 farmers<sup>4</sup> from the population of 209 certified Karoo Lamb farmers were contacted by way of referral sampling, a convenience sampling method, and interviewed on their farms.<sup>5</sup>

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<sup>4</sup> This is in line with the 10-times rule of thumb suggested by Barclay et al. (1995) for SEM research, as well as with the more comprehensive rules of thumb of Cohen (1992).

<sup>5</sup> Although the certification scheme keeps a database of its certified members, very few farmers have provided their GPS coordinates. This shortcoming made it exceptionally difficult to track down these

The mechanisms that are in place to govern the Karoo Lamb supply chain were measured in much the same way as by Raynaud et al. (2005) and Wever et al. (2010). This evaluation included semi-structured questions regarding the types of agreements that the various supply chain stakeholders have with one another. During the same time, five certified abattoirs that slaughter Karoo Lamb were also interviewed. The Karoo Lamb product was followed downstream, and data was collected from two certified processors and/or packers and five retail outlets to enable an evaluation of the Karoo Lamb supply chain. The enforcement mechanisms, on the other hand, were investigated by means of a combination of semi-structured questions and a conjoint experiment to examine the current and preferred enforcement mechanisms at the various supply chain stages.

### **3.1 Methodological approach: Enforcement mechanisms**

As a result of the ‘light’ monitoring conducted by the State-appointed assignee, the quality and origin standards of Karoo Lamb are currently poorly enforced, specifically at the farm level. Alternative monitoring mechanisms are therefore investigated by using a conjoint experiment to test, specifically the Karoo farmers’<sup>6</sup> preference, for alternative monitoring and enforcement mechanisms.

According to Johnson (1985), a conjoint analysis is a quantitative marketing research method that can be used to measure consumer perceptions and preferences. It enables the researcher to model consumer trade-offs between products or services with multiple attributes, just as the consumer presumably does in reality (Padberg et al., 1997). A conjoint experiment, therefore, measures the relative importance that consumers attach to each product attribute, as well as the utility that consumers attach to the different attribute levels (Malhotra, 1996).

According to Hair et al. (1995), conjoint analyses have been used extensively in the evaluation of consumer preferences for hypothetical products in food-related marketing research (see *inter alia* Vermeulen et al., 2007; Murphy et al., 2000; and Baker, 1999). This paper, however, aims to adapt the conjoint experiment for a non-conventional application.

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farmers for interviews. Attempting to select and interview a random sample from the vast Karoo region (totalling 46 million hectares) would be a lengthy and very expensive task.

<sup>6</sup> The farmers are the only supply chain stakeholders that participated in the conjoint experiment since they are the only group of stakeholders with a large enough sample to warrant a conjoint experiment.



The conjoint experiment is devoted to better understand the relative importance that Karoo farmers attach to incentives, monitoring mechanisms, and penalties when participating in the Karoo Lamb supply chain.

The conjoint experiment is developed around three essential characteristics required for ideal enforcement mechanisms to govern the Karoo Lamb supply chain successfully, and ultimately protect the authenticity of the product. These attributes are the incentive or the price premium received by the stakeholder for one kilogram of Karoo Lamb; the mechanism utilized to monitor the supply chain stakeholders to ensure compliance with the standards, and the penalty to be imposed on non-complying stakeholders (summarised in Table 2).

**Table 2: The selected levels for each attribute<sup>7</sup>**

<b>Attribute</b>	<b>Attribute levels</b>
Incentive <sup>8</sup>	Level 1: 0USD/kg price premium
	Level 2: 0.16USD/kg price premium
	Level 3: 0.24USD/kg price premium
Monitoring	Level 1: Monitored for compliance with every Karoo Lamb delivery
	Level 2: Monitored for compliance once a year
	Level 3: Monitored for compliance during times of drought
Penalty	Level 1: Expelled for three years for non-compliance
	Level 2: Expelled for five years for non-compliance
	Level 3: Expelled forever for non-compliance

Following detailed discussions with industry experts<sup>9</sup> and other Karoo Lamb supply chain stakeholders, it was decided to use 0USD/kg, 0.16USD/kg, and 0.24USD/kg. Most of the farmers receive a price premium for Karoo Lamb; 20 % receive anything between 0.08USD and 0.14USD/kg, and 31 % receive 0.16USD/kg. However, a substantial 49 % of the farmers receive no premium at all. Upon conversing with the farmers and abattoirs, a 0.24USD/kg premium for Karoo Lamb was often mentioned as the “golden number” (??% of farm gate price) . Moreover, an acceptable price premium for Karoo Lamb, revealed by the surveyed farmers, also hovered around 0.24USD/kg.

<sup>7</sup> These attributes were developed based on interviews with industry experts and other Karoo Lamb supply chain stakeholders.

<sup>8</sup> Exchange rate of R12.46/USD (11/01/2018).

<sup>9</sup> The industry experts included an experienced researcher in the lamb supply chain, the chairperson of the Karoo Meat of Origin certification scheme, the chairperson of the Karoo Development Foundation, and the manager of one of the certified Karoo Lamb abattoirs.

The monitoring attribute was specified as three options: monitored once a year, during times of drought, or monitored with every delivery. Currently, the certification scheme audits farmers every four years (with the promise of random audits every year) for compliance, while abattoirs, processors and/or packers, and retail outlets are audited twice annually to ensure compliance with the protocols (KMOO, 2016a). This rendered the inclusion of monitoring, at least once a year necessary. After considering the current monitoring mechanisms set out by the certification scheme and conversing with industry experts, it was evident that the authenticity of the Karoo Lamb product is at its most vulnerable during times of drought.<sup>10</sup> One of the attribute levels was therefore to only monitor stakeholders, mainly the Karoo farmers, during times of drought. However, to ensure the authenticity of Karoo Lamb with one hundred percent certainty, every batch of Karoo Lamb delivered should ideally be monitored at the point of slaughter. Although this could potentially be done by means of a rumen sample or a liver analysis, these methods are expensive, which is not always justified, and take time, which given the short shelf life of meat is not always practical.

In terms of penalizing non-compliant stakeholders, the certification scheme basically has two measures in place, one for severe deviations in the protocol and one for slight deviations. In the case of a severe default, the certification will be revoked with immediate effect, and the stakeholder will have to reapply for certification. For minor misdeeds, a request to correct the mistake will be issued, together with a follow-up audit without any significant consequences. However, if the mistake has not been rectified, the certification will be revoked (KMOO, 2016a). Shockingly, 94.5 % of the farmers are unaware of any penalties being imposed for non-compliance. Notwithstanding the penalties set out by the certification scheme, the discussions with industry experts revealed the need for more stringent penalties. Based on these discussions, the levels for the penalty attribute were therefore identified as; expel for three years, expel for five years, and expel forever.

The total number of hypothetical scenarios for the experiment was 27, three attributes with three levels each. The 27 scenarios were reduced to a fractional factorial design of nine

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<sup>10</sup> During times of drought, lambs might need supplementary feed. According to the Karoo Lamb protocols, 300g of supplementary feed per lamb per day is allowed. However, farmers might be providing feed in excess of this allowance, especially during times of severe droughts. The fact that farmers do not record the supplementary feed provided is even more troubling.

scenarios by means of the Orthogonal Design procedure to make the conjoint experiment more manageable for the surveyed farmers (summarised in Table 3).

The full-profile approach was selected for this conjoint analysis, and a user-friendly rank order method was chosen to measure the preferences of the farmers. The farmers were asked to rank the nine options from most preferred (1) to least preferred (9) during an in-depth interview, after which the data were coded and analyzed in IBM SPSS Statistics 24.

**Table 3: The 9 enforcement mechanism scenarios derived from the Orthogonal Design**

Option	Incentive attribute	Monitoring attribute	Penalty attribute
1	0.24USD/kg price premium	Monitored for compliance with every Karoo Lamb delivery	Expelled forever for non-compliance
2	0.24USD/kg price premium	Monitored for compliance once a year	Expelled for three years for non-compliance
3	0USD/kg price premium	Monitored for compliance during times of drought	Expelled forever for non-compliance
4	0USD/kg price premium	Monitored for compliance with every Karoo Lamb delivery	Expelled for three years for non-compliance
5	0.16USD/kg price premium	Monitored for compliance with every Karoo Lamb delivery	Expelled for five years for non-compliance
6	0.24USD/kg price premium	Monitored for compliance during times of drought	Expelled for five years for non-compliance
7	0.16USD/kg price premium	Monitored for compliance during times of drought	Expelled for three years for non-compliance
8	0.16USD/kg price premium	Monitored for compliance once a year	Expelled forever for non-compliance
9	0USD/kg price premium	Monitored for compliance once a year	Expelled for five years for non-compliance

The analysis of the conjoint results was based on the following additive conjoint model:

$$Y_k = \sum_{j=1}^J \sum_{m=1}^M \beta_{jm} x_{jm}$$

where

$Y_k$ : estimated total utility for product scenario k

C: constant

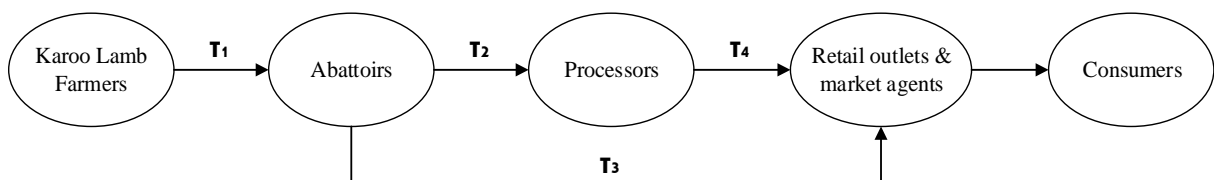
$\beta_{jm}$ : partial utility for attribute level m of attribute j

$X_{jm}$ : 1 if scenario k has an attribute level value m for attribute j,  
0 if else.

### 3.2 Methodological approach: Governance mechanisms

In order to understand the mechanisms that govern the Karoo Lamb supply chain, the paper employs the same approach as Raynaud et al. (2005), and Gellynck and Molnár (2009), by utilizing the transactional model. This model disaggregates the Karoo Lamb supply chain into the following dyadic transactions (Figure 1) and then fits each transaction with a set of determining variables and ultimately a specific governance mechanism:

- Transaction between Karoo farmers and abattoirs (henceforth referred to as T1)<sup>11</sup>
- Transaction between abattoirs and processors (T2)
- Transaction between abattoirs and retail outlets (T3)
- Transaction between processors and retail outlets (T4)



*Note: Retail outlets encompass retailers, butcheries and deli's*

**Figure 1: Karoo Lamb supply chain with transaction numbers**

Following the decomposition of the Karoo Lamb supply chain, the responses from the various supply chain stakeholders are matched with the determining variables included in Gellynck and Molnár's (2009) governance mechanism typology (summarised in Table 4). By matching the responses to the determining variables, it is possible to identify the typical governance mechanisms that govern each transaction in the Karoo Lamb supply chain.

The governance typology includes spot market (S) and vertical integration (VI) on the two polar ends, and five intermediate forms that are applicable to food chains (Gellynck and Molnár, 2009). These intermediate forms include; non-contractual relationship with a non-qualified partner (S+), non-contractual relationship with a qualified partner (S++), contractual relationship (C), relation-based alliance (RB), and equity-based alliance (JV).

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<sup>11</sup> Since the Karoo Lamb supply chain relies on free-range production practices on natural Karoo vegetation, input suppliers are omitted from the transactional model.

After a thorough literature review, Gellynck and Molnár (2009) identified the following nine variables used to explain the various governance mechanisms; “irrelevance of identity”, “length”, “ex-ante restriction on the choice of partner”, “written contract”, “contract specifications”, “resource sharing”, “joint forces for mutual benefits”, “focus of control”, and “intensity of control”.

**Table 4: Governance mechanisms and their determining variables**

	<b>Spot market (market)</b>	<b>Non-contractual relationship</b>		<b>Contractual relationship</b>	<b>Relation-based alliance</b>	<b>Equity-based alliance</b>	<b>Vertical integration (hierarchy)</b>
	<b>S</b>	<b>with a non-qualified partner</b> <b>S+</b>	<b>with a qualified partner</b> <b>S++</b>	<b>C</b>	<b>RB</b>	<b>JV</b>	<b>VI</b>
<b>Irrelevance of identity</b>	Yes	No	No	No	No	No	No
<b>Length</b>	Short	Medium	Long	Long	Long	Long	Long
<b>Restriction on the choice of partner</b>	No	No	Yes	No	No	Yes	Yes
<b>Written contract</b>	No/Yes	No	No	Yes	No/Yes	Yes	Yes
<b>Contract specifications</b>	Price	General terms and relational objectives	General terms and relational objectives	All or part of each party's obligation	All or part of each party's obligation	Alliance agreement	Governance structure
<b>Resource sharing</b>	Owns own resources	Owns own resources	Owns own resources	Owns own resources	Owns own resources	Each party put resources into new entity	Common ownership
<b>Joint forces for mutual benefit</b>	No	No	No	No	Yes	Yes	Yes
<b>Intensity of control</b>	Low	Low	Low	Moderately Low	Moderate	Moderately high	High
<b>Focus of control</b>	Immediate transaction	Relationship	Relationship	Contract terms	Relationship	Property rights of stakeholders in limited joint entity	Property rights of stakeholders in full entity

Source: Adapted from Gellynck and Molnár, 2009

#### 4. Understanding the mechanisms that enforce quality and origin

The data support the notion that the State-appointed third party is relatively unsuccessful when it comes to the monitoring of the Karoo farmers for compliance with quality and origin standards. Surprisingly, the data reveals that 85 % of the farmers believe that they are not monitored for compliance following that initial audit, prior to certification. A mere 15 % of the farmers, although they are somewhat unsure, believe that they are monitored by their abattoirs and their livestock agents for compliance with the Karoo Lamb standards. Of the surveyed farmers, 32.8 % were due for an announced audit by the State-assigned independent third party. Shockingly, none of these farmers knew about this audit, and none of them has been contacted for a follow-up audit at the time of the survey. However, as expected, the abattoirs, processors, and retail outlets confirmed that they are aware of the annual audits and that these audits were indeed being conducted.

The conjoint experiment revealed specific alternative solutions that could be applied, specifically at the farm level, to ensure the credibility of the Karoo Lamb product. Before the conjoint analysis was evaluated, the data were assessed for validity (Hair et al., 1995). The external validity (the representativeness of the sample to the research study population) of the sample was confirmed, with 34.9 % of the population being represented by the surveyed sample. Kendall's tau-b correlation coefficient was used to measure the strength and direction of the relationship between the observed and estimated rank order variables with a view to assessing the internal validity (the fit of the model to the data) of the conjoint results. The Kendall's tau-b coefficient was statistically significant at a 1 % probability level of significance for all the farmers who participated in the research. Moreover, the joint Kendall's tau-b coefficient (0.898) is indicative of a representative model. The entire sample of 73 farmers was therefore included in the conjoint analysis.

The range of utility values for each attribute, summarised in Table 5, provides a measure of importance to the farmers' overall preference for the various attributes.

**Table 5: Relative importance values of conjoint attributes**

<b>Attribute</b>	<b>Average importance score</b>
Premium	45.862
Monitor	25.826
Penalty	28.312

From the scores of average importance, it is clear that the farmers regard the price premium, as an incentive mechanism, as being the most important attribute. The farmers furthermore preferred a more severe punishment strategy, compared to a more frequent monitoring mechanism, for ensuring compliance with the Karoo Lamb standards.

The additive conjoint equation was used to estimate the utilities (path-worth) scores and the standard errors for each attribute level (summarised in Table 6 **Error! Reference source not found.**).

**Table 6: Conjoint analysis utility estimations**

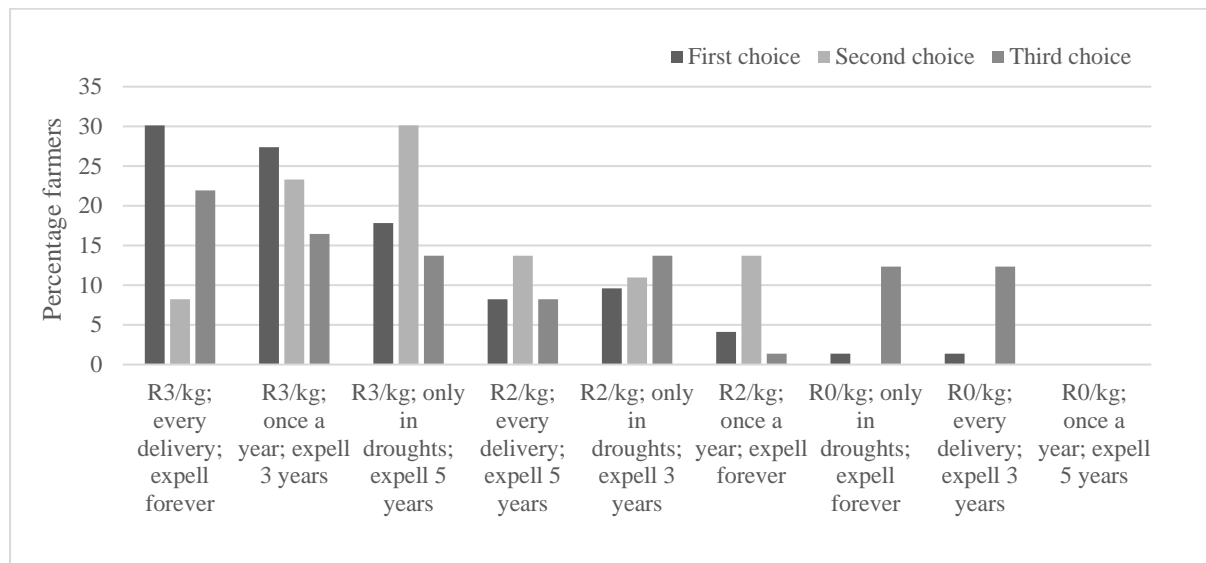
Attribute and attribute level	Utility estimate	Standard error
<b>Premium</b>		
R0/kg	-2.042	0.058
R2/kg	0.403	0.058
R3/kg	1.639	0.058
<b>Monitor</b>		
Every delivery	-0.204	0.058
Once a year	0.060	0.058
Drought	0.144	0.058
<b>Penalty</b>		
Three years	0.292	0.058
Five years	0.097	0.058
Forever	-0.389	0.058
(Constant)	5.000	0.041

As expected, the farmers value a higher price premium for Karoo Lamb more than a lower or no price premium (0USD/kg). This is clearly reflected in the high positive utility (1.639) for a premium of 0.24USD/kg and a sizeable negative utility (-2.042) for no premium. Farmers furthermore regard the inconvenience of continuous monitoring during every delivery and the harsh penalty of being expelled forever for non-compliance as comprising a disutility, at -0.204 and -0.389, respectively.

Given the results of the conjoint analysis, it seems that the Karoo farmers prefer relatively high premiums (0.24USD/kg), being monitored only during times of drought, and a liability to be expelled for only three years if non-compliance is detected. A closer look at the most preferred enforcement mechanisms, to ensure the compliance of farmers with the Karoo Lamb standards, revealed a tie between two of the nine scenario cards. The majority of the surveyed farmers (30 %) preferred enforcement mechanisms that (i) include a relatively high premium



(0.24USD/kg), (ii) allow monitoring with every delivery or only during times of drought and, (iii) expel non-compliant farmers forever or for five years (Figure 2).



**Figure 2: Farmers’ preferred enforcement mechanisms**

Although statistically significant results for the rest of the supply chain could not be derived by means of a conjoint experiment because of the relatively small sample sizes, the questionnaires revealed the following. The abattoirs prefer relatively high premiums (0.16USD/kg), to be explicitly monitored during times of drought, and to be expelled for only three years. The processors revealed the same expulsion preference for three years but preferred higher premiums (0.24USD/kg) and strict annual audits. The retail outlets preferred relatively high premiums (0.16USD/kg) (similar to the abattoirs), and a maximum expulsion of three years (similar to the rest of the supply chain), but preferred to be monitored more frequently for compliance.

Given the results of the conjoint experiment, it might be in the certification scheme’s best interest to focus on the enforcement attributes that in fact present a disutility to farmers so as to guarantee compliance with the Karoo Lamb standards. Stricter enforcement mechanisms are expected to provide a disincentive to farmers to behave opportunistically by not complying with the set quality and origin standards. This would shift the emphasis of the certification scheme to ensure continuous monitoring and a very harsh penalty. According to the conjoint analysis, the ideal enforcement mechanism to be rolled out across the supply chain would encompass a relatively high premium (0.24USD/kg), monitoring with every delivery (or at

least during times of droughts), and a harsh penalty of being expelled forever, or for at least five years, for non-compliance.

The correct vehicle for ensuring proper implementation of the enforcement mechanisms throughout the supply chain, and not just at processing stages, remains a challenge. According to the findings of Raynaud et al. (2005) and Wever et al. (2010), different quality (and in this case, origin) enforcement mechanisms should be aligned with different governance mechanisms. A detailed understanding of the mechanisms that govern the Karoo Lamb supply chain is therefore needed at this point.

## **5. Understanding the Karoo Lamb's unique governance situation**

Before the registration of the certification mark in 2011, Karoo Lamb was embedded in the commodity lamb supply chain and marketed as conventional lamb without any differentiation. Owing to many years of commodity style operations, and the importance of shifting large volumes due to squeezed margins, the Karoo Lamb supply chain is still, seven years later, believed to be mainly governed by market transactions.

However, the upgrading of the commodity lamb supply chain to a more differentiated supply chain such as Karoo Lamb, with its own set of quality and origin standards, brings about potential contractual hazards. In the Karoo Lamb case, the primary hazards to control are the free riding of those stakeholders with no link to the Karoo region (see Lafontaine & Shaw, 2005 for an example in franchising), and the uncertainty that surrounds the measurement of quality performance (Barzel, 1982; Foss, 1996). When the actions of Karoo Lamb supply chain stakeholders have negative externalities and these externalities are also less observable, market-like governance mechanisms are less efficient. The occurrence of these contractual hazards, therefore, warrants a move from the currently observed market-like mechanisms to more hybrid or even hierarchical mechanisms.

A detailed analysis of the semi-structured questions pertaining to the governance of the Karoo Lamb supply chain revealed that the supply chain is predominantly governed by market-like mechanisms, as opposed to hierarchical governance (Table 7).

**Table 7: Transaction detail subsequent governance mechanism**

<b>Transaction</b>	<b>Detail</b>	<b>Governance mechanism</b>
<b>T1</b>	Medium- to long-term relationships.	<b>S++ and RB</b>
	Farmers and abattoirs are certified to produce, process and sell Karoo Lamb.	
	Contracts are verbal and generally negotiated on a weekly basis.	
	Prices are set weekly, based on the market price for conventional lamb with a premium added for Karoo Lamb.	
	Volumes are arranged according to the farmer’s capacity – small deviations from the volumes are allowed with prior notice.	
	Although higher prices are realized for better quality carcasses (grade A2 and A3 <sup>12</sup> ), specifications are not set.	
Control is relational in nature and is focused on the reputation of the farmer and the abattoir, and the trust between the stakeholders.		
Some of the farmers in one of the Karoo districts are shareholders in the abattoir. They have long-term relationships with one another and transact for mutual benefit.		
<b>T2</b>	Medium- to long-term relationships.	<b>S++ and VI</b>
	Abattoirs and processors are certified to process and sell Karoo Lamb.	
	Contracts are verbal and negotiated weekly.	
	Prices are negotiated weekly, based on the market price for conventional lamb with a premium added for Karoo Lamb.	
	Volumes are arranged according to the market demand, and deliveries are strictly according to the order.	
	Quality specifications are set according to the market demand, typically A2 and A3 carcasses.	
Although the contract terms are stricter, the control remains relational in nature and is focused on the reputation of the abattoir and processor.		
One of the abattoirs holds its own smaller processing plant and is only allowed to process lamb from that particular abattoir. The abattoir has full control over the processor, and jointly makes decisions for mutual benefit.		
<b>T3</b>	Medium- to long-term relationships.	<b>S++</b>
	Abattoirs and retail outlets are certified to process and sell Karoo Lamb.	
	Contracts are verbal and negotiated weekly.	
	Prices are negotiated weekly, based on the market price for conventional lamb with a premium added for Karoo Lamb.	
	Volumes are arranged according to the market demand, and deliveries are strictly according to the order.	
	Quality specifications are set according to the market demand, typically A2 and A3 carcasses.	
Control between the butcheries and abattoirs are relational in nature and built on trust and reputation.		
Although control is somewhat stricter when dealing with retail outlets, the particular retail outlets are independently owned and operate under voluntary trading principles. Control, therefore, remains relational.		
<b>T4</b>	Medium to long term.	<b>S++</b>
	Processors and retail outlets are certified to process and sell Karoo Lamb.	
	Contracts are verbal and negotiated weekly.	
	Prices are negotiated weekly, based on the market price for conventional lamb, with a premium added for Karoo Lamb.	
Volumes are arranged according to the market demand, and deliveries are strictly according to the order.		

<sup>12</sup> The South African Meat Industry Company classifies carcasses based on age (A – youngest to C – oldest) and fatness (0 – no fat to 6 – excessively overfat).

<b>Transaction</b>	<b>Detail</b>	<b>Governance mechanism</b>
	Quality specifications are set according to the market demand, typically A2 and A3 carcasses.	
	Although control is somewhat stricter when dealing with retail outlets, the particular retail outlets are independently owned and operate under voluntary trading principles. Control between the processor and retail outlets are therefore relational in nature and supported by trust and reputation.	

*Note: T1 – transaction between farmers and abattoir, T2 – abattoir and retail outlets, T3 – abattoir and retail outlets, T4 – processors and retail outlets. S++ – Non-contractual relationship with qualified partner, RB – Relation-based alliance, VI – Vertical integration*

The abattoirs are only permitted to procure lamb from certified Karoo Lamb farmers to ensure the authenticity of Karoo Lamb. Similarly, the certified farmers are only permitted to market their lamb as Karoo Lamb to certified abattoirs. The data revealed that most of the farmers deliver to mainly one abattoir (60.3 %). Their reasons for being loyal to one abattoir include: (i) they have long-term relationships with the particular abattoir (25 %), (ii) they prefer to support their town or are shareholders in the abattoir specific (20.7 %), (iii) it is more convenient compared with other abattoirs (17.2 %), (iv) the abattoir offers the best price (12.9 %), (v) the abattoir is trustworthy (12.1 %), and (vi) other reasons, such as sound management and excellent service (12.1 %). On average, these farmers have been delivering to the same abattoir for 22 years, with 27.4 % of farmers being loyal to the same abattoir for 30 or more years. As a rule, the abattoirs do not have preferred farmers, since the only requirement for the sale of Karoo Lamb is that the farmers should be certified to produce Karoo Lamb.

The nature of the relationship between the majority (79.3 %) of the Karoo farmers and abattoirs (T1) is, therefore, a non-contractual relationship with a qualified partner (S++). It is considered ‘non-contractual’ because the relationship between the farmers and the abattoirs is not governed by a formal contract but by informal verbal agreements, generally initiated by the farmers (72.3 %), either a day (20 % of the farmers) or a week (74.1 % of the farmers) in advance, with only 5.9 % of the farmers making arrangements more than a week in advance. Prices are based on weekly market prices for conventional lamb, to which a price premium for Karoo Lamb, between 0.16USD and 0.24USD/kg per kilogram carcass weight, is added. In general, farmers are free to market any number of lambs, provided that the abattoir has the capacity to slaughter the animals. There is, however, a two-level capacity issue – abattoir capacity and the size of the certified orders. The abattoir will only slaughter Karoo Lamb when they have retail orders for the certified carcasses. These informal, non-contractual relationships

between certified abattoirs and farmers usually expire upon delivery. However, some of the farmers in one of the districts (20.7 % of those surveyed) are shareholders in the abattoir, and their relationship shows characteristics of a relation-based alliance (RB) (Gellynck & Molnár, 2009). These farmers have been loyal to this specific abattoir for many years and transact with the abattoir for mutual benefit.

The second transaction (T2) in the Karoo Lamb supply chain involves one large certified processor and one smaller certified processor whose transactions with the certified abattoirs are governed by two extremes on the governance continuum; non-contractual relationship with a qualified partner (S++) and vertical integration (VI), respectively. The transactions between the abattoirs and the large independent processor are less formalized, non-contractual, and based on mutual trust and the reputations of the stakeholders (S++). This, somewhat informal, relationship is mainly attributable to the fluctuating demand for Karoo Lamb. In addition to the varying quantities of Karoo Lamb traded between the abattoir and processor, these stakeholders also trade conventional lamb that is governed by more formal contracts and control mechanisms. To some extent, these more structured agreements support the less structured Karoo Lamb negotiations. At the other end of the governance continuum, the transactions of the smaller processor are governed by vertical integration (VI). This particular processor is only allowed to process Karoo Lamb carcasses, slaughtered by its holder abattoir, that originate from its certified farmers. In line with market demand, both the large and smaller processors prefer the A2 or A3 carcass grades. Prices are generally negotiated from the weekly market price, plus margins for costs and profits and an additional price premium for Karoo Lamb. Deliveries are made strictly according to orders placed by the processor.

Currently, Karoo Lamb is mainly sold through independent butcheries and delis, with only one retail chain being certified to sell Karoo Lamb. The relationships between the abattoirs and the retail outlets (T3) are very much relational in nature, with the abattoirs and retail outlets dealing either with one another directly or via a Karoo Lamb marketing agent.

The transactions between the processors and retail outlets (T4) are similar in nature. The Karoo Lamb products processed by the larger certified processor are currently destined for its surrounding certified retail outlets and are governed by non-contractual (relational) arrangements (T4). Similar to T2, smaller retail outlets participating in T4 transactions utilize the existence of more formal control mechanisms, such as the auditing of processors by large

retail chains, as a guarantee for the reputation of a larger processor. Unlike the products of the large processor, the Karoo Lamb products processed by the smaller, vertically integrated processor are processed, vacuum packed, boxed and frozen for sales direct to consumers via a marketing agent. The box sales depend on the excellent reputation of the Karoo district from which the lamb originates, and on the excellent service of the vertically integrated abattoir and processor.

Both the T3 and T4 relationships depend on the reputation of the stakeholders and the extent to which the orders have been fulfilled, and payments have been successfully made. In very much the same way as in T2, because of market demand, the most popular carcass grades remain A2 and A3 carcasses. Similarly, prices are negotiated weekly, based on the market price of lamb, with a price premium for Karoo Lamb. Although the larger retail chain depends on stricter mechanisms (such as annual audits at the processing facilities) to control the more formal contracts of conventional lamb trades, the Karoo Lamb control mechanisms remain, probably due to small volumes, relational in nature.

The analysis of the Karoo Lamb supply chain reveals non-contractual arrangements with qualified partners as being the most frequently utilized governance mechanism. These mechanisms are similar to the specific mechanisms with which the transactions of the meat PDO supply chains are governed (Raynaud et al., 2005). According to Wever et al. (2010) and Raynaud et al. (2005), these market-like mechanisms successfully govern the supply chains of products with a geographical indication, provided that reliable public monitoring and enforcement mechanisms are in place to guarantee quality and origin. However, in South Africa, where sporadic, 'light' enforcement of standards mainly beyond the farm gate is at the order of the day, the credibility of Karoo Lamb might be in trouble.

## **6. Aligning the enforcement and governance mechanisms**

The compliance of stakeholders with quality and origin standards depends, to a large extent, on the success of the enforcement mechanisms. This statement also holds true for the Karoo Lamb supply chain. However, the fact that the Karoo Lamb standards are enforced by a State-assigned, but stakeholder paid, third-party waters down the effectiveness of the enforcement mechanism. In fact, it is in the third party's own best interest not to strictly monitor the supply

chain stakeholders, but rather to conduct ‘light’ monitoring and ‘light’ enforcement thereby ensuring a steady income stream. More worrying is the fact that the assignee does not enforce the Karoo Lamb standards at the farm level since there is no incentive (driven by the consumers), and no budget, to warrant this monitoring. Public monitoring by the State assignee, therefore, appears to be insufficient for the needs of Karoo Lamb, at least at the farm level.

In order to ensure the credibility of Karoo Lamb, better enforcement mechanisms are specifically required at the farm level, in which the origin attribute of the product is embedded. The conjoint experiment revealed that the farmers experience disutilities for stricter penalties and continuous monitoring, which means that the most appropriate enforcement mechanism would include these attributes. This is also a convenient and cost-effective mechanism for the assignee since every batch of Karoo Lamb delivered by the farmer could be continuously monitored at the abattoir with relative ease.

However, this change in the enforcement of the Karoo Lamb standards towards stricter and perhaps private enforcement means that the governance mechanism should be revised. Currently, the Karoo Lamb supply chain operates within the conventional lamb supply chain and is therefore mostly governed by non-contractual relationships between qualified partners (S++). However, according to Wever et al. (2010) and Raynaud et al. (2005), this mechanism seems insufficient when public monitoring is insufficient. A move towards a more hierarchical mechanism is therefore expected, which would ensure a stronger focus on private or mutual enforcement mechanisms. This means that the stakeholders in the supply chain would be jointly responsible for the enforcement of the quality and origin standards, and therefore the credibility of Karoo Lamb.

During the data collection process, it became clear that those farmers who are shareholders in the abattoir that they deliver to are more loyal to their abattoir and to the certification scheme. The adoption of governance mechanisms that resemble relation-based alliances (RB), where stakeholders are mutual owners and feel mutually responsible for an exceptional product, seems plausible, especially at T1 and T2. It is expected that the collectively owned Karoo Lamb initiative, is better off being governed by mechanisms that rely on the mutual control of the stakeholders and on the mutual benefit accruing from complying with the Karoo Lamb standards. However, because public monitoring at T3 and T4 is adequate, the current market-like mechanisms used to govern these transactions should suffice (Table 8). These

recommendations are in line with the findings of Raynaud et al. (2005), Gellynck and Molnár (2009), and Wever et al. (2010). These authors suggest greater coordination at T1 and T2 and less coordination between T3 and T4.

**Table 8: Proposed changes in the governance mechanisms**

Transaction	Current governance mechanism <sup>13</sup>	Proposed governance mechanism	Reason suggested change
T1	S++ and RB	RB	RB alliances are based on mutual trust. RB brings about mutual benefits as a result of a common interest in producing top quality lamb. Currently, the few transactions governed by RB seem to be more successful, compared with the transactions governed by S++.
T2	S+++ and VI	RB or VI	VI would allow proper alignment of the abattoirs' and processors' marketing strategies and the alignment of their quality management systems to produce top quality lamb. RB with control in the relationship rather than in property rights (as is the case with VI) might be equally efficient in aligning marketing strategies and quality management systems without seriously having to restructure the transaction.
T3 and T4	S++	S++ or C	The fluctuating consumer demand for Karoo Lamb dictates the T3 and T4 relationships. In future, more stable demand for Karoo Lamb could allow a change in the governance mechanism from a S++ to a C mechanism. C will allow high-quality lamb to be regularly supplied with short lead times.

*Note: T1 – transaction between farmers and abattoirs, T2 – abattoirs and retail outlets, T3 – abattoirs and retail outlets, T4 – processors and retail outlets. S+++ – Non-contractual relationship with qualified partner, C – Contractual relationship, RB – Relation-based alliance, VI – Vertical integration*

## 7. Concluding remarks and recommendations for future research

The paper revealed that, although Karoo Lamb seemed to rely on public certification, similar to the European PDO brands, the monitoring and enforcement of Karoo Lamb's quality and origin standards by a State-appointed third party seems to be biased. Because of this biasedness, the market-like mechanisms usually recommended to govern products supported by public certification might be unsuccessful. Interestingly, the monitoring and enforcement of Karoo Lamb's quality and origin standards are particularly troubling at the farm level. More coordinated governance mechanisms, especially at T1, are therefore required to enforce the Karoo Lamb standards adequately.

<sup>13</sup> The current governance mechanisms referred to in Table 8 are explained in detail in Table 7.



Although the somewhat tricky question, should Karoo Lamb be governed by market-like or hierarchical governance was sufficiently addressed in this paper, the most prominent limitation was encountered in the small population of abattoirs, processors, and retail outlets. The small population made conjoint experiments at each level of the supply chain impractical, and statistically significant inferences could not be made on the abattoirs', processors' and retail outlets' preferences for enforcement mechanisms. It is expected that conjoint experiments with larger populations at each level of the supply chain (such as those analyzed by Wever et al. (2010) and Raynaud et al. (2005)), would reveal interesting results about the preferred enforcement mechanisms.

Another interesting angle for future research, and this is in line with what Raynaud et al. (2005) did, is to contrast the enforcement and governance mechanisms of various differentiated products. In doing this, the influence of different production factors, different marketing factors, and different stakeholder attributes, amongst other things, on the enforcement and governance mechanism will be revealed.

This Karoo Lamb case study acts as a point of departure for future studies on the protection of various products with a geographical indication, specially in developing countries. Subsequent research can build on this work, by analyzing regional products from other developing countries, to gain a better understanding of the different ways in which these products are protected within a particular country's institutional framework. The distinct institutional environments of these different countries are also expected to bring about differing enforcement and governance mechanisms, which are sure to reveal exciting findings. The research can also be expanded to a dynamic approach that will shed light on the consequences of different governance choices.

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