

# The Role of Farmers to Improve Quality in the Corn Supply Chain as Animal Feed in South Sulawesi Province

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## The Role of Farmers to Improve Quality in the Corn Supply Chain as Animal Feed in South Sulawesi Province

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### Abstract

This study aims to determine the role of corn farmers in improving the quality of the corn supply chain as Animal Feed in South Sulawesi Province. The research was conducted from June to August 2019. The population was all animal feed maize farmers in South Sulawesi Province. The samples were animal feed maize farmers and marketing agencies in Sidenreng Rappang district, South Sulawesi Province. Data analysis was descriptive quantitative. The results showed that corn farmers had the role of operationalizing 4 precise, namely the right seed, the right fertilizer, the right harvest and the right water content.

Keywords: corn farmers, supply chain, animal food

### INTRODUCTION

Agriculture future was faced with fundamental change because of the changes in the global economy, biological technology development, various international agreements, product demand, product packaging and environmental sustainability [1]. In order to achieve these development goals, today's livestock have been directed towards developing in more advanced livestock with the area approach the production center which is concerned development in certain areas, using appropriate technology and implementation of a new runway; efficiency, productivity and sustainability [2] including supply chain system. Supply chain management system is an approach that is applied to integrate suppliers, retailers, warehouses and other storage areas efficiently so that the resulting product can be distributed to the quantity, place and the right time [3] and [4]. The framework of supply chain indicates behavior and interaction of complex companies. Hence, the supply chain should be designed in a way that chain network characteristics and interactions are taken into account [5] and [6].

One of the mainstay commodities of the national agricultural sector is pipil corn which can be used for household consumption and animal feed industry needs including broilers and layers [7]. Corn farmers are the first members of the supply chain in supplying maize and have an important role in the supply chain mechanism. The role of farmers is important because the quality, quantity and continuity of corn is very much determined by the farmers. Added by [8] states that the main factor in producing quality maize is largely determined by the resources owned by the farmers, including the corn seeds used in cultivation, farmers' knowledge of the water content of maize and ownership and operation of the post-harvest equipment they have. [9] states that to achieve self-sufficiency in corn, the role of the government is needed in terms of cheap corn seed assistance, fertilizer subsidies, drying machines, tractors, counseling and training on how to operate and maintain them and expand the planting area. To improve this condition deficiency, supply chain management and involvement of the main actors and supporting actors and business actors are needed in handling it, because if this continues it does not get attention will affect the enthusiasm of farmers in managing corn. For example, farmers as the main actors need get guidance, training and provision of technology, market transfers and assistance with corn dryers complete with the ownership of the corn storage warehouse provided by supporting actors (government) or business actors (private parties). Therefore, it is necessary to know the role of corn farmers in the animal feed supply chain in South Sulawesi province.



## RESEARCH METHODS

For research purposes in order to measure the strength of farmers in providing quality corn raw materials as broiler and layer animal feed in connection with the smooth supply of maize to the final consumer through village collectors or one supply chain, the results of the survey and data collection on 60 respondent farmers, and 12 village collectors traders, using indicator (1). Type of seed; (2). Knowledge moisture content; (3). Ownership and operation of a corn dryer; and (4). Assistance and training from extension agents in operationalization and maintenance of corn plants so that the seeds are right, the fertilizer is right, the harvest time is right, the water content is right.

## RESULTS AND DISCUSSION

The results of research on the strength of farmers in maintaining the quality of supply maize as raw material for broiler and screen animal feed are determined to 4 indicators. For more details, the research results can be seen in **Table 1**.

**Table 1.** Farmers' Ability to Maintain Quality of maize to be supplied to Village traders (PD).

No.	Variables and Indicators	Criteria	Score Point	The Number of People	Score Number	Average Score
1.	The Quality of Corn and the type of seed Quality corn And knowledge of	(1). Hibryd	3	29	87	2,33
		(2). Local	2	38	76	
		(3). Not Clearly	1	5	5	
2.	And knowledge of moisture content (%)	(1). < 20	3	14	42	1,65
		(2). 20-30	2	19	38	
		(3). >30	1	39	39	
3.	Quality corn And ownership and Operational Drayer tool	Possessing and capable of operational	3	2	6	1,13
		Not having and can operationality	2	5	10	
		Not having And not Can operationality				
4.	Quality Corn Produced by farmers in terms of 4 Right (seed, harvest, fertilizer, water content)	(1) quality 4 right	1	65	65	1,34
		(2) Quality 3 is right				
		(3). Quality <3 right	3	5	15	
			2	15	30	
			1	52	52	
	Total			288	465	6,45
	Average				1,61	1,61

Source: Research Results, 2018

Table 1 shows that the maize that has been supplied by farmers to village collectors (PD) is in the medium quality category, namely the average value achieved by farmers is 1.61 or in the medium category value range, namely 1.34 - 2.67. This is still far from the expectation of the expected quality of values > 2.67. With this condition, it is necessary to find the cause by referring to the four indicators proposed.

The results of research on the quality variable using indicators of the type of corn seed cultivated by farmers showed that 72 respondents from 60 maize farmers and 12 village collectors showed that there were 29 respondents (40%) stated that farmers had recognized and utilized hybrid seeds or superior seeds that sourced from the government through the food plants and horticulture office according to the recommended standard operating procedure of conformity expected for the need for raw materials for manufactured animal feed. Meanwhile, 38 other respondents (52.78%) stated that the farmers had cultivated maize, but the seeds used were local varieties or it could be stated that farmers using local variety seeds had not met the quality standards required as raw material for feed, broiler and layer cattle. Likewise, according to 5 respondents (6.94%) there are still farmers who practice corn cultivation who have not been able to distinguish between hybrid or superior varieties of maize seeds and local varieties so that with this condition it can be stated that these farmers in corn farming have not applied quality standards. However, continuously from 3 categories of assessments of farmers in the use of seeds to achieve quality, it is included in the medium category with the value achieved is 2.33. It is in the value range 1.34 - 2.67. This means that it can be



interpreted that the medium category value is due to the uneven distribution of seeds by the government to the maize farmers, and as the cause of uneven distribution to farmers as a result of the weak data base on maize farmers in the four research locations districts. Apart from a weak data base, other causes are also weak monitoring and evaluation and control by institutions that have the potential to achieve self-sufficiency in maize. From the farmer's point of view according to 67 respondents (93.06%) there are still corn farmers who are not yet independent as a result of weak capital and very high dependence on the government, and the rest, according to 5 respondents (6.94%) farmers are already independent and the relatively small nature of dependence on government.

For the value of the quality variable with the indicator of the ability of farmers to use seeds in cultivating corn that moves from the range of categories, namely category 1, a small score of 1.34 is not able to utilize corn seeds in cultivation, the score of 1.34 - 2.67 category 2 is quite capable, and a score of greater than 2.67 category 3 is able to utilize hybrid corn seeds or superior maize seeds in the cultivation of high quality maize crops. For categorization of respondent classes and interpretations in terms of utilization of corn seeds in cultivation as shown in Table 2.

**Table 2.** Categorization of Respondent Farmer Classes and Interpretation of the Utilization of Seeds for Corn Cultivation.

Score Range	Class Category	Interpretation
< 1,34	Not yet able to take advantage of corn seeds	The score of 2.33 on the quality of maize marketed by farmers to village collectors is low quality to meet the quality standards of broiler and layer feed because the seeds planted by the farmers are non-hybrid, also the aid from the government of hybrid corn seeds has not been distributed evenly to the community. Also, farmers are not yet independent due to their weak capital.
1,34 - 2,67	Quite capable make use of corn seeds	
> 2,67	Quite capable make use of corn seeds	

Source: Research Results, 2018

The results of research on quality variables using indicators of farmer knowledge in terms of percent (%) moisture content of maize that meet quality standards in the maize supply chain for broiler and layer feed needs show that out of 72 respondents came from 60 corn farmers and 12 collectors. The village shows that there are 14 respondents (19.44%) stating that the farmers have known the quality of the moisture content of maize according to the quality standards to be supplied as raw material for broiler and layer animal feed, which is less than 20% (<20%). While the other respondents, amounting to 19 people (26.39%) stated that farmers who apply a moisture content of 20% -30% to the maize supplied to collectors are to use drying in the open with the help of lighting from sunlight, and with high levels such water was bought up by village collectors. This means that even though the farmers are happy to be sold out to village collectors because the price is slightly cheaper than the moisture content <20%. This means that farmers who are classified as selling their maize at a level of 20% -30% do not fully have the knowledge of quality standards as raw material for supply of broiler and layer feed needs. Likewise, according to 39 respondents (54.17%) they have not used the knowledge of the application of moisture in maize that is marketed through the supply chain from farmers to collectors so that the price they receive is much cheaper when compared to farmers with knowledge of 20% - 30% moisture content, and <20%.

However, continually from 3 categories of assessment of farmers in the application of moisture content knowledge to achieve quality, including the medium category with the value achieved is 1.65. It is in the value range 1.34 - 2.67. This means that it can be interpreted that with a moderate category value, farmers have not evenly acquired knowledge of the quality of corn in terms of moisture content. As the cause, most of the corn farmers do not understand the quality standards of quality and according to him, the most important thing is that corn can be sold for the needs of family life. Another disadvantage is that farmers have not evenly owned a dryer or dryer, and no less important that corn farmers do not have a storage warehouse and drying place, so that corn drying is held in front of houses on the outskirts of the highway.

As a solution so that the quality of maize meets quality standards which will be correlated with an increase in the income of maize farmers, farmer group institutions must be strengthened in the context of the maize supply chain activities from farmers to collector traders to be coordinated with one-door movements, also with strong institutional strength, warehouse or silo. Those with high capacity can be built, likewise if there is government procurement and assistance such as a dryer or dryer through the farmer group institution, and also if the dryer is limited in number, the group administrator can schedule the use of the dryer. Likewise, other activities can be coordinated in an appropriate manner through the farmer group institution because all members must comply with the consensus agreement and the rules that have been compiled with the members of the farmer group.

For the value of the quality variable with the indicator of knowledge of the moisture content of the quality standard of maize quality that moves from the range of categories, namely category 1, a small score of 1.34 is that there is no knowledge of the quality of quality standards in terms of moisture content of maize, the score is 1.34 - 2.67 categories 2 knowledge is



sufficient to be able to apply, and a score of greater than 2.67 category 3 has knowledge of quality standards in terms of moisture content of maize.

For categorization of respondent class and interpretation of quality standard quality in terms of moisture content of maize as shown in Table 3.

Table 3. Categorization of Respondent Farmer Classes and Quality Interpretation of Quality Standards in terms of Corn Moisture Content.

Score Range	Class Category	Interpretation
< 1.34	Low moisture content knowledge	The score of 1.65 in the medium category indicates that the level of knowledge of moisture content needs to be improved through mentoring and training, it is also needed, strengthening farmer group institutions and needs coordinated management by the management, if the equipment belongs to the group. Government assistance is needed, in the form of: dryer, mentoring / training, warehouse or corn silos and dryer floors.
1.34 - 2.67	Sufficient moisture content knowledge	
> 2.67	High moisture content knowledge	

Source: Research Results, 2018

The results of research on quality variables using indicators of ownership and the ability to operate the corn dryer tool to meet quality standards in the supply chain of maize for broiler and layer feed needs show that out of 72 respondents from 60 maize farmers and 12 village collectors show there are 2 Respondents (2.78%) stated that farmers have and are able to operate dryer tools to dry corn for quality standards according to supply needs as raw material for broiler and layer animal feed. Meanwhile, respondents who knew how to operate a dryer but did not have a dryer tool were 5 respondents (6.94%). Other respondents totaling 65 people (90.28%) stated that they did not have a dryer and did not know how to operate a dryer or dryer on corn commodities. This means that most of the 90.28% farmers are not yet empowered in supplying quality maize, so that this condition is one of the causes of the lack of smooth supply of maize from farmers to the broiler and layer feed industry. And if this does not get the attention of the government in the form of dryer tools, assistance and training for the operation using the dryer tool then there is something that is undesirable, namely the supply of maize from the upstream does not run smoothly and the quality, quantity and continuity cannot be fulfilled, thus providing opportunities, the occurrence of imports of maize.

When viewed from the research results from a continuum approach from 3 categories of assessments of farmers in possession of the dryer tool and dryer operational expertise to achieve quality, including the low category with the value achieved is 1.13. It is in the value range <1.34. This means that it can be interpreted that the low category value indicates that on average the corn farmers in the research location regarding the ownership of a corn dryer or drying machine are not able to procure a drying machine, of course it is correlated with the low level of farmers who are able to operate the dryer tool. Disrupt the smooth running of the supply chain from upstream to downstream. In other words, corn quality standards are difficult to achieve. As the cause, most of the maize farmers have weak capital, also if there is government assistance to farmers it is not properly distributed or ownership of the dryer or dryer with government assistance has not been distributed evenly.

As a solution so that the quality of maize meets quality standards which will be correlated with the increase in income of maize farmers, farmer group institutions must be strengthened in the context of maize supply chain activities from farmers to collector traders to be coordinated with one-door movements, also with strong institutional support, the dryer tool can pass through group institutions. Another solution if there is government procurement and assistance such as a dryer or dryer can be through farmer group institutions, and also if the dryer is limited in number, the group administrator can schedule the use of the dryer. Likewise, other activities can be coordinated in an appropriate manner through the farmer group institution because all members must comply with the consensus agreement and the rules that have been compiled with the members of the farmer group.

For the value of the quality variable with indicators of ownership and the ability to operate the dryer tool with the aim of the quality standard quality of maize that moves from the range of categories, namely category 1, a score of 1.34 is not having a dryer and does not have the ability to operate a dryer. Meanwhile, it has the ability to operate a dryer but does not have a dryer for the needs of quality standards in terms of moisture content of maize, a score of 1.34 - 2.67 is in category 2, and a score of greater than 2.67, category 3 does not have and is unable to operate. Corn dryer in order to achieve quality standards in terms of moisture content of corn. For categorization of respondent classes and interpretation of quality standards in terms of ownership and ability to operate dryer as shown in Table 4.

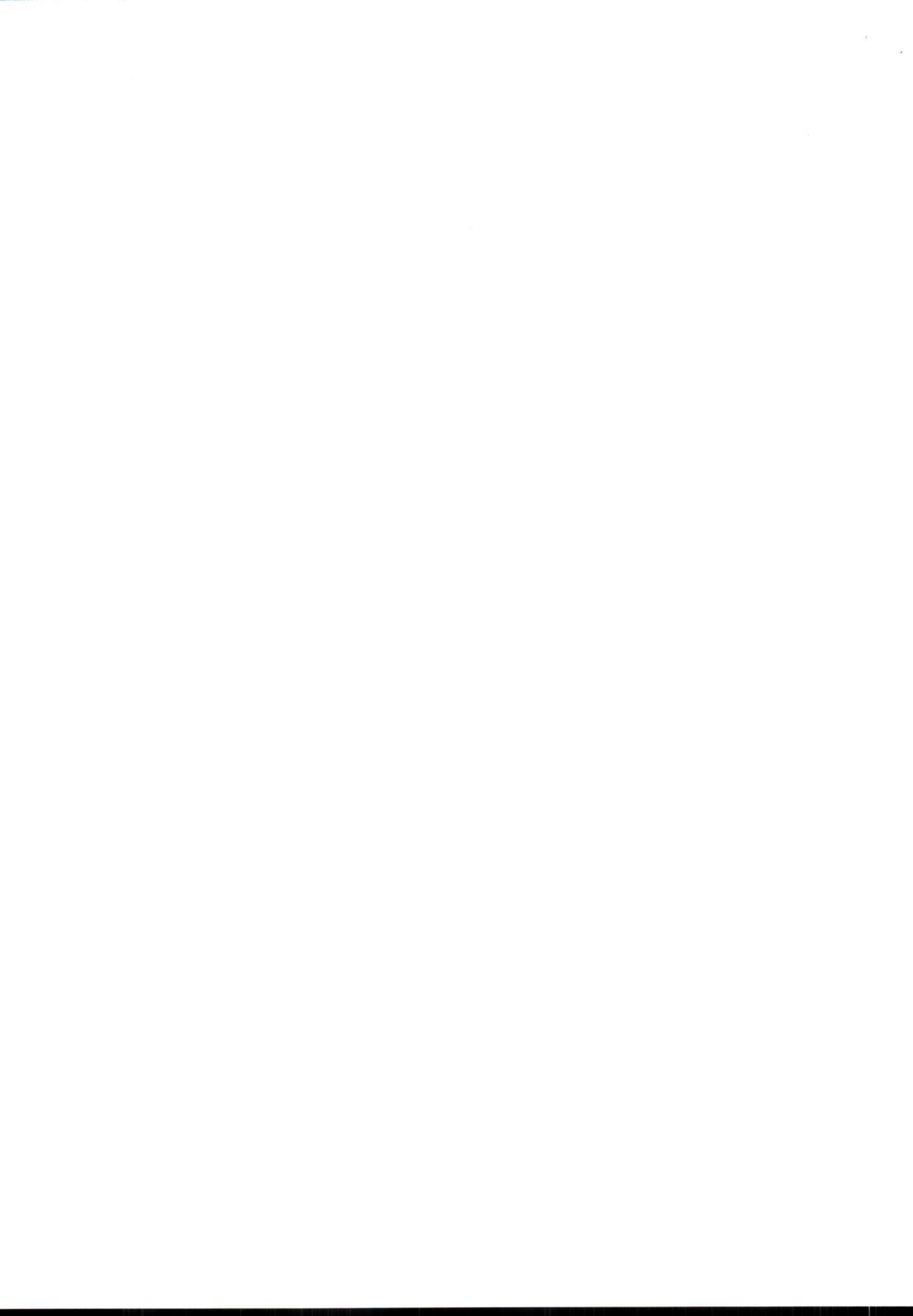


Table 4. Categorization of Respondent Farmer Classes and Quality Interpretation of Quality Standards in terms of ownership and ability to operate dryer

Score Range	Class Category	Interpretation
< 1,34	Low	The value of 1.13 in the low category indicates that the level of ownership and ability to operate the dryer needs to be improved through mentoring and training, it is also needed, strengthening farmer group institutions and needs coordinated management by the management, if the group's equipment is government assistance, in the form of dryer.
1,34 - 2,67	Moderate	
> 2,67	High	

Source: Research Results, 2018

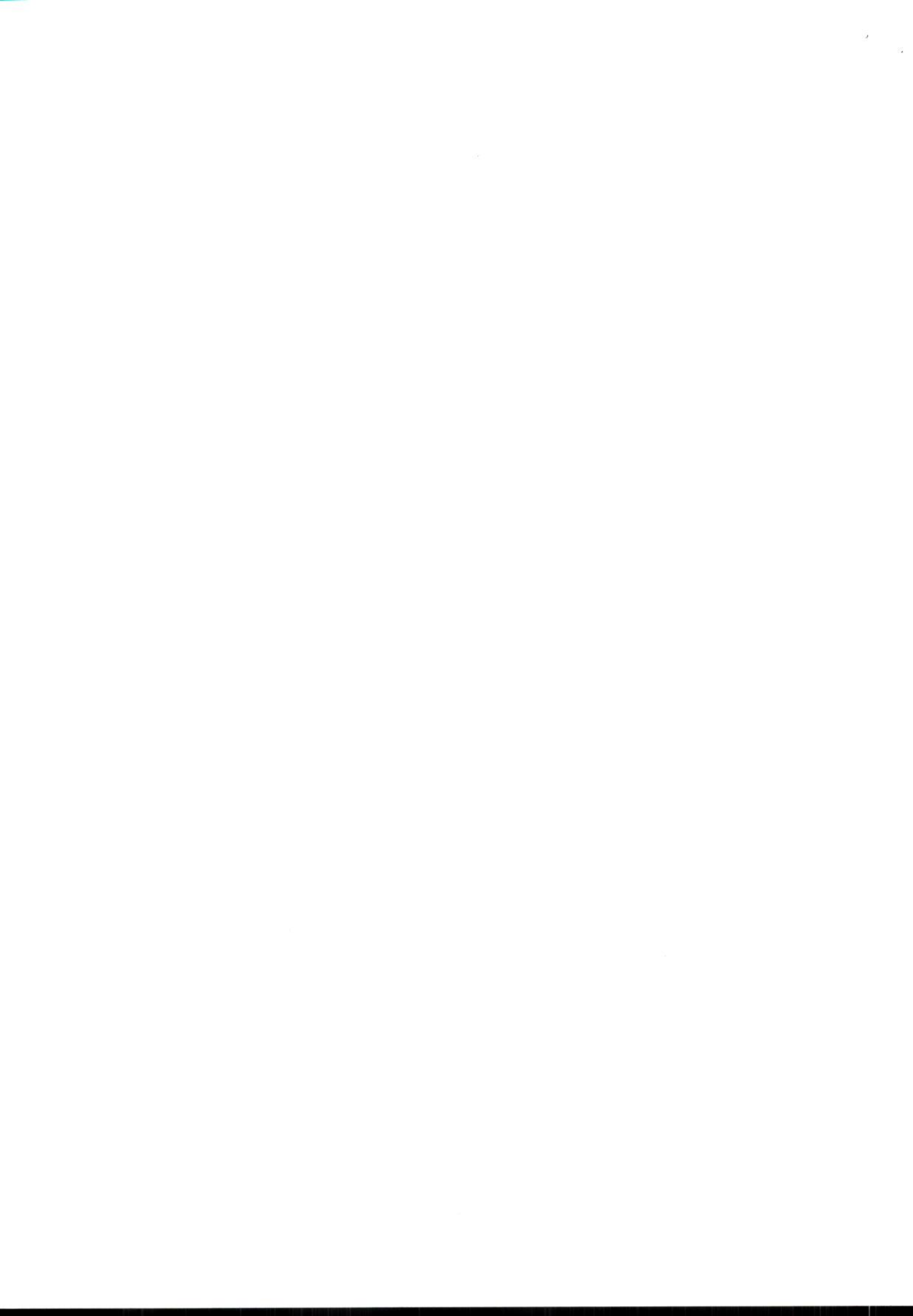
The results of the research on quality variables using the right 4 indicators (right seed, right harvest, right fertilizer and right moisture content) of corn produced by farmers to be supplied to village collectors (PD) traders who will then be supplied to the final consumer and will be used as feed. If broiler and layer livestock meet quality standards, then based on the statements of 72 respondents from 60 maize farmers and 12 village collectors, it shows that there are 5 respondents (6.94%) including having produced or implemented 4 rights in the operation of corn cultivation to post-harvest which meet the quality standard quality of corn. Meanwhile, respondents who operated 3 precisely were 15 respondents (20.83%). Other respondents, namely running <3 exactly amounted to 52 people (72.22%). This means that out of 72 respondents, there are 63 respondents, 87.5% who do not understand how to produce corn that meets quality standards. This means that there is also weak information and guidance for extension officers or a lack of good cooperation in corn farmer groups, so this condition has an impact on farmers, always in a weak position or the maize produced is bought cheaply by village collector traders, then this opportunity is used by village collector traders to sell to sub-district traders then sub-district traders sell to wholesalers and district-level wholesalers manage it to be used as complementary feed or additional feed for concentrate from feed industry, which is then sold to independent breeders who raise oilers and layers. The weak condition of implementing the 4 right is one of the factors causing insufficient supply needs for the feed industry so that to anticipate the feed industry companies import corn from other countries. And if this does not receive assistance, training and information from farmer assistants such as organic and private extension workers, this incident will continue, and the self-sufficiency of corn programmed by the government for household consumption needs and broiler feed and layers will be difficult to achieve. When viewed from the results of research with a continuum approach from 3 categories of assessment of farmers in the accuracy treatment to produce corn that meets quality standards or 4 quality standards, based on the results of the analysis shows or is in the moderate category with the value achieved is 1.34. It is in the value range 1.34 and 2.67. This means that it can be interpreted that with the moderate category value, it shows that on average the maize farmers in the research location regarding the mastery of farmers on how to produce maize that meet quality standards are not fully able to operate due to weak information and guidance and assistance from organic and private extension workers as well. Weak internal institutional cooperation of farmer groups. However, this condition can be improved if critical awareness of both the extension agent and internal groups is owned by the extension agent and the farmers.

For the value of the quality variable with indicators of ownership and the ability to operate the dryer tool with the aim of the quality standard quality of maize that moves from the range of categories, namely category 1, a score of 1.34 is not having a dryer and does not have the ability to operate a dryer. Meanwhile, it has the ability to operate a dryer but does not have a dryer for the needs of quality standards in terms of moisture content of maize, a score of 1.34 - 2.67 is in category 2, and a score of greater than 2.67, category 3 does not have and is unable to operate. Corn dryer in order to achieve quality standards in terms of moisture content of corn.

For categorization of respondent classes and interpretation of quality standards of quality in terms of the ability of farmers to operationalize the 4 right, namely the right seed, the right fertilizer, the right harvest and the right water content as shown in Table 5.

Table 5. Categorization of Respondent Farmer Class and Quality Interpretation of Quality Standards in terms of farmers' ability to operate the 4 right (seed, fertilizer, harvest and moisture content).

Score Range	Class Category	Interpretation
< 1,34	Low	The value of 1.34 in the medium category shows that the level of ability to operationalize the right 4 can still be improved through mentoring and training, also needed, strengthening farmer group institutions and critical awareness for officers and farmers both in terms of genuineness, responsibility, openness, justice, honesty, trust and cooperation.
1,34 - 2,67	Moderate	
	High	



➤ 2,67		
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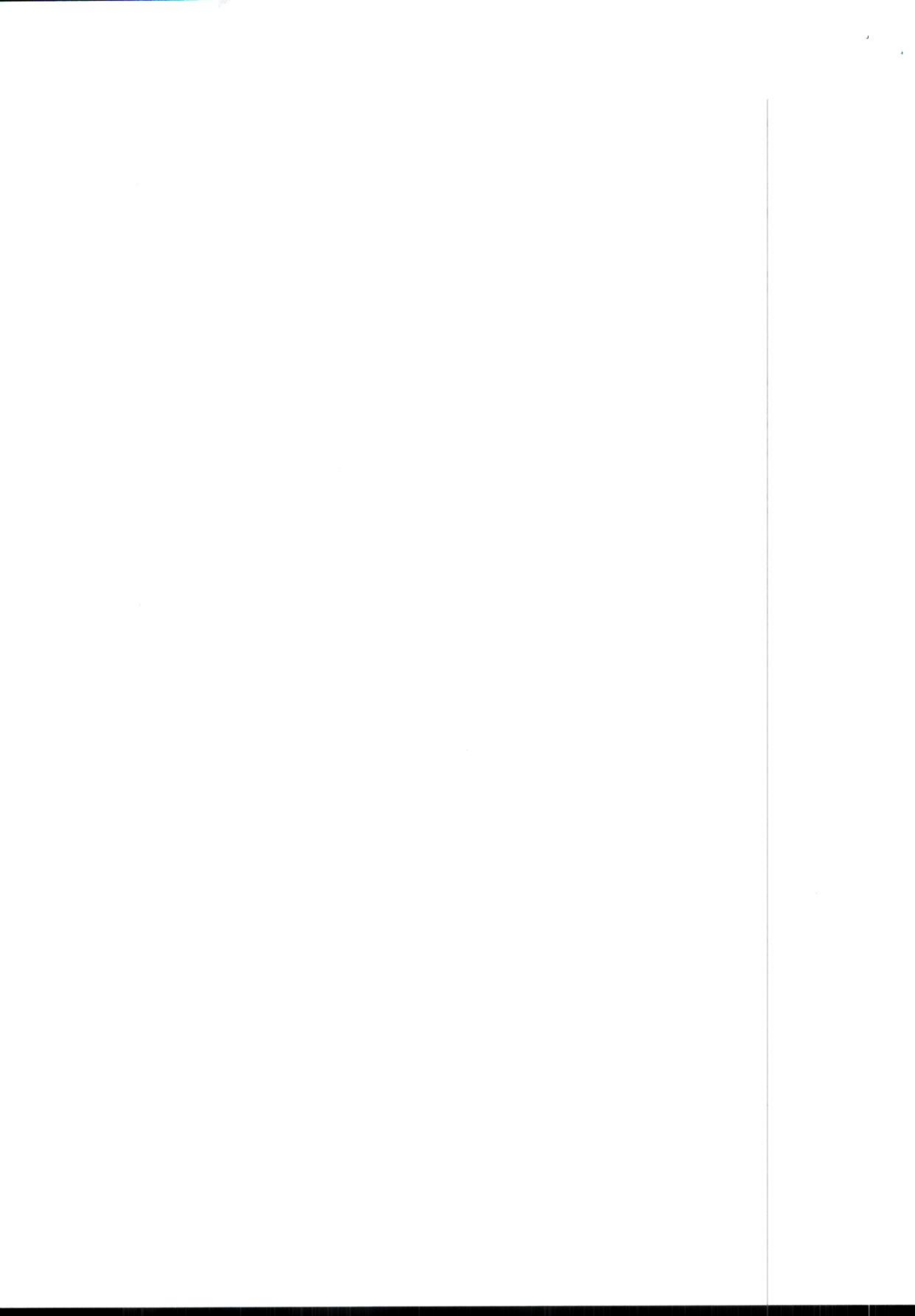
8 Source: Research Results, 2018

Table 5 shows that the categories of maize farmers in the standard quality interpretation are in the middle category but need additional training and institutional strengthening.

#### CONCLUSION

Corn farmers had the role of operationalizing 4 precise, namely the right seed, the right fertilizer, the right harvest and the right water content and need additional training

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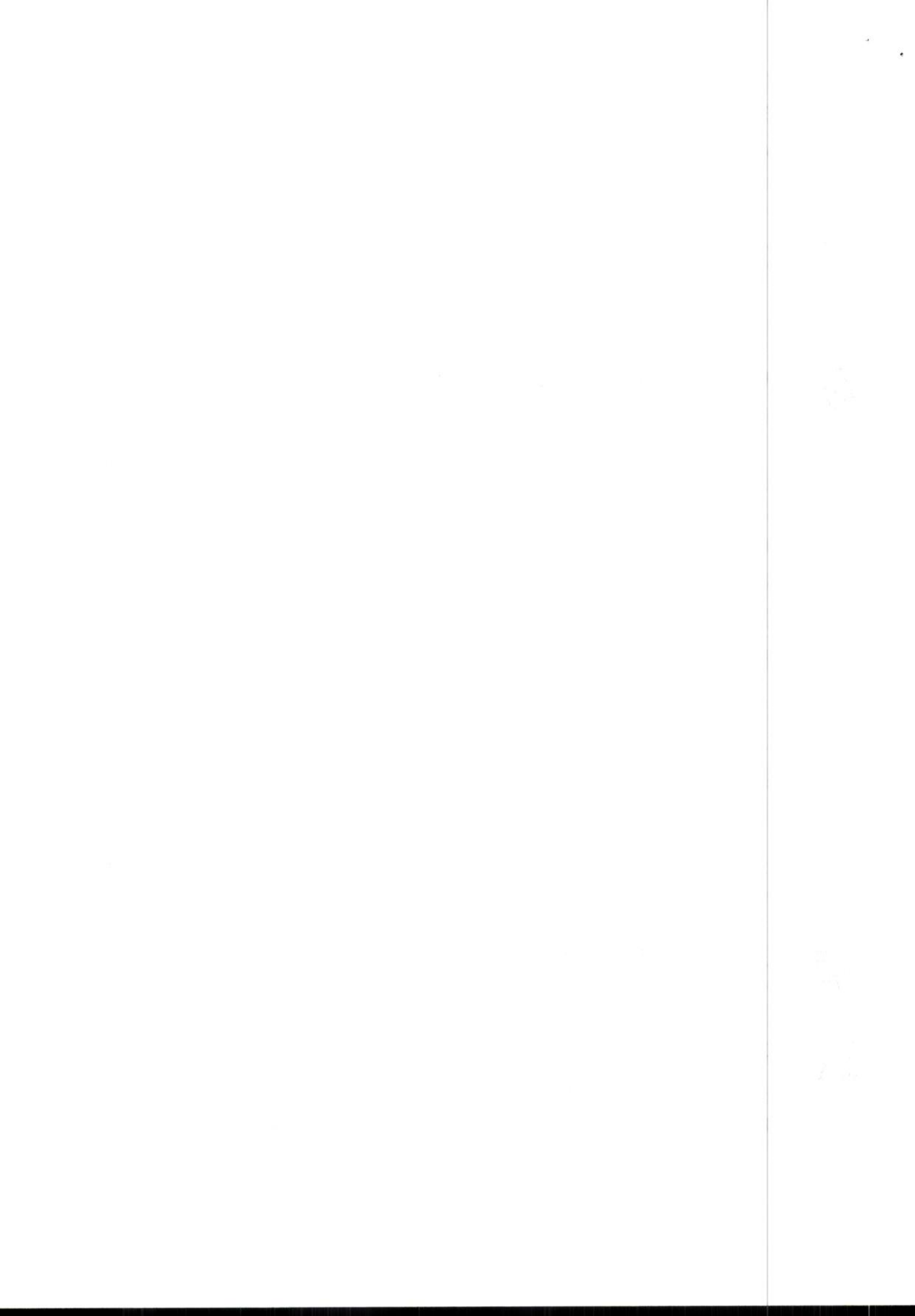
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