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Aspirational hope, dairy farming practices, and milk production: Evidence from a randomized controlled trial in Bolivia

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\textbf{A B S T R A C T}

Development economics has increasingly studied the role of diminished aspirations and other internal constraints that may form poverty traps. We present results from a controlled experiment to develop aspirational hope among 531 dairy farmers in Bolivia. Subjects in the treatment group participated in three coaching sessions that involved watching an inspiring documentary and participating in group workshops designed to augment aspirations related to dairy production. Results three months after baseline show an increase of 0.20 in both an aspirational hope index and a business goals index, a 1.07 increase in an index of quality-enhancing practices, but an insignificant increase in milk production. Increases in aspirations and best practices were strongest among those displaying high levels of intrinsic motivation at baseline.

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1. Introduction

The role and nature of internal constraints has received increasing attention in development economics. For many decades the focus of the discipline in both research and practice has been on addressing the external constraints of the poor in areas such as credit, education, and infrastructure. In contrast, internal constraints involve the psychological aspects of poverty that may continue to manifest among the poor even when effective interventions are able to release many external constraints. When internal constraints are binding, diminished aspirations, low self-efficacy, and a narrow locus of control all may contribute to poverty traps (Barrett et al., 2019).

A great deal of recent research has focused on the effects of aspirations on development in particular. Theoretical work such as Ray (2006), Dalton et al. (2016), Genicot and Ray (2017) and Lybbert and Wydick (2018) has provided a framework for understanding the role that aspirations may play in development settings. At the same time, experimental work has sought to understand whether light-touch aspirations interventions are able to increase investments in education and family enterprises (Bernard et al., 2014; Janzen et al., 2017; Riley, 2017; Aguinaga et al., 2019; Batista and Seither, 2019; Bhan, 2020; Orkin et al., 2021; and Rojas et al., 2022), where this new body of research has generally found modest to strong impacts from interventions that highlight the achievements of potential role models who in other ways are similar to the subjects.\textsuperscript{1} Our research seeks to contribute to this emerging literature through a coaching intervention among Bolivian dairy farmers, involving a video-based documentary, that emphasizes role-modeling and aspiring to best dairy-farming practices and higher levels of milk production.

Studies related to ours have evaluated the effects of economic and political interventions on aspirations. These include the analysis of a gender quota policy in India (Beaman et al., 2012), microcredit in Sierra Leone (García et al., 2020), and child sponsorship in Kenya, Indonesia, and Mexico (Ross et al., 2021). Others integrate economic and psycho-social interventions such as exposure to educated professionals in the context of the PROGRESA cash transfer program in Mexico (Chiapa et al., 2012), social interaction with leaders combined with a cash transfers in Nicaragua (Macours and Vakis, 2014) and the integration of a psychosocial parenting intervention with a financial literacy training in South Africa (Steinert et al., 2018). Results of these studies show positive effects...
on aspirations along with some economic outcomes, especially those related to investment in children’s education.

Other studies investigate the impacts of pure aspirational interventions. These interventions have exposed participants to role models, often through recorded video, based on the premise that aspirations are determined by observing others who are relatively better-off (Ray, 2006). Along with the pioneer intervention by Bernard et al. (2014) in Ethiopia showcasing successful entrepreneurs, subsequent studies have been carried out by Lubega et al. (2017) on preventing HIV infection in Uganda, Batista and Seither (2019) on fostering entrepreneurialism in Mozambique, and Bhan (2020) on creating aspirations for school children in India. In research on microcredit recipients in Mexico, Rojas et al. (2022) add two components to the video intervention: a refrigerator magnet to write goals and a series of workshops on aspirational hope. These video interventions have generally been successful in the first stage of elevating at least short-term aspirations, but have shown a mixed range of results in the second stage of translating these elevated aspirations into higher levels of health, education, and enterprise profits.

Our study differentiates from this previous work in several respects. First, Bolivia is an unusual country where there are high rates of poverty, but where there is access to microcredit, schooling, and infrastructure. To some extent, these external constraints are relaxed and internal constraints are more likely to be binding since fewer interventions are focused on relaxing them. However, we acknowledge that even when internal constraints are relaxed, external constraints might still be binding even in our context.

Second, while most of the previous work has been carried out in the education, health, and microenterprise areas, ours is the first aspirations intervention to our knowledge to be carried out in a rural and agricultural production context. Specifically, we work with smallholder farmers engaged in milk production, which might face a different set of challenges than, say, microentrepreneurs, when addressing issues related to productivity growth and increased income.

Third, relative to the subject populations of other studies, where most participants engaged in a variety of economic activities, our sample is much more homogeneous. We work with smallholder farmers all engaged in milk production. All of the dairy farmers in our study reside in the province of Aroma, and most belong to the Aymara indigenous group. Thus, our subjects face similar issues affecting productivity such as extreme weather conditions, and low levels of hope, aspirations, and agency, creating a favorable backdrop for an aspirations intervention. Finally, conditional on the number of cows owned by a given dairy farmer, variation in income is largely driven by large productivity gaps. An average cow among our subjects produces approximately 6 L of milk per day in our study area, which can be compared with theoretically attainable averages closer to 20 L per day. This combined homogeneity across subjects and large productivity gaps gives our study the advantage of studying homogenous production output where there is considerable space for increases in production increases on the intensive margin. In short, the environment in which we operate appears to be one in which we would be likely to find impacts from an aspirations-based intervention.

Our sample is composed of 531 dairy farmers, 283 in a treatment group and 248 in control, that distribute their milk to 52 milk delivery points. We survey both groups at baseline (before the intervention) and at endline to estimate average treatment effects three months after the intervention. In our setting, farmers typically own an average of three cows. Because each farmer acts as a price-taker in a competitive market, productivity and scale strongly predict income. We test the potential of the intervention to affect aspirational hope—decomposed into aspirations, pathways, and agency (Snyder, 1994). Further, following Bernard et al. (2014), we measure aspirations in terms of forward-looking productivity goals. We study the effect the intervention had on aspirated level of production, aspirated level of productivity, and aspirated number of cows in production along with best dairy farming practices (including the degree of information gathering related to dairy operations), quality, and productivity.

We use an ANCOVA estimator to obtain average treatment effects of the intervention on different components of aspirational hope, dairy practices, and milk production. Three months after the intervention we find positive average treatment effects on aspirations generally, on aspirated milk productivity and production, and on business goals, but that effects on conceptualization of pathways and sense of agency are of only borderline statistical significance. We find some evidence of behavioral change: the treatment group engages significantly more in productivity and quality-enhancing practices, but in our ANCOVA estimations we do not find significant increases in milk production in the treatment group.

In this sense our results contrast with randomized aspirations interventions that have found significant impacts on business outcome variables, such as Batista and Seither (2019) and Aguinaga et al. (2019). But they are consistent with other similar research that has found large impacts on aspirations and intermediate behaviors, but with low-to-modest effects from aspirations interventions on final enterprise outcomes such as Garlick et al. (2021) and Rojas et al. (2022). In this respect our results also fall into line with this growing body of evidence on aspirational interventions that finds consistently positive short and medium-term impacts of aspirations interventions related to children’s education (e.g. Bernard et al., 2014; Ross et al., 2021; Bahn, 2020; Garlick et al., 2021), where aspirations and their corresponding outcomes may be more malleable, but where aspirational interventions have more mixed results with impacts on final economic outcomes in the enterprises of self-employed adult entrepreneurs.

Moreover, our study is the first to test heterogeneity of effects both with respect to baseline failure to aspire (Dalton et al., 2016), and with respect to baseline intrinsic motivation (Ryan and Connell, 1989). While previous research such as Rojas et al. (2022) finds that aspirations interventions have the greatest impact among those with low aspirations at baseline, we find that baseline failure to aspire affects the interventions’ efficacy with respect to boosting aspirations, but not subsequent outcomes. Instead, the more intrinsically motivated subjects in our study were at baseline the more effective the aspirations intervention was on both boosting aspirations and changing behaviors in the direction of best dairy practices.

Finally, to further probe the effect on quality-enhancing practices we use administrative data provided by a dairy aggregator to study milk rejection rates. Using a fixed effect estimator, we find that treatment significantly reduces rejections, and that this reduction is explained principally by lower likelihood of excessive acidity—something that can be addressed through better care for the cows. Therefore, while milk production did not increase in the period under analysis, we can expect that the intervention’s effect on seeking quality-enhancing practices might have medium-term income implications resulting from the greater share of milk that is not rejected by buyers.

Taken together with other new research, our results add to the body of evidence from studies in other contexts regarding the effects of light-touch aspirational interventions. Our results suggest that aspirations interventions are unlikely to be a panacea across a wide variety of individuals, activities, and contexts. Rather, taken together with other new research, they suggest that critical to their effectiveness may be careful targeting toward those with malleable aspirations and those best able to channel
aspirations into behaviors that most strongly mediate aspired outcomes.

2. Framework and background

2.1. Aspirations, economic choices, and development

Aspirational hope is central to development economics. It is the motivational force that propels human agency into a wide array of behaviors in education, health, and enterprise that, multiplied across a population, lead to broadly based economic development.

Hope is typically defined as the expectation or wish related to a desired outcome. In the development economics literature, Lybbert and Wydick (2018) distinguish between “wishful hope” (the desire for something to occur over which one has little agency) and “aspirational hope” (the focus of human energy toward an anticipated and desirable outcome). They base the latter concept within the framework of Snyder (1994, 2002) that identifies three necessary conditions for hope, for which individuals must 1) develop tangible goals and aspirations; 2) formulate pathways toward these goals; and 3) embody a sense of agency, a belief that they are able to successfully navigate the designated pathway toward the goal.

One key question relates to how aspirations are normally formulated. Ray (2006), based on Appadurai (2004), argues that aspirations are socially determined. Individuals formulate their aspirations through an aspirations window through observing the achievements of others similar to themselves. They then undertake actions, perhaps related to schooling, health behavior, making social connections, or investing in enterprises, to close the aspirations gap along the continuum of the desired dimension that exists between where they stand presently and where they aspire to be. Ideally, Ray points out, this gap is neither so large as to discourage effort entirely, nor so small that only a token level of action is required to bridge this gap. Janzen et al. (2017) test Ray’s aspirations gap theory and provide supporting empirical evidence from Nepal.

Lybbert and Wydick’s (2018) theoretical model, constructed around Snyder’s (1994) three components of aspirational hope, demonstrates how aspirations, pathways and agency relate to interventions aiming to relax internal and external constraints to elevate economic outcomes. In this model, aspirations form a reference point in the utility function giving it a shape similar to the value-function of Kahneman and Tversky (1979). Agency and pathways are modelled via a production function and output constraints on the production function (which can potentially block pathways). This aspirations-dependent utility function is maximized subject to the production function and constraints on pathways. In this model, aspirations can be modified by exogenous economic or psychological interventions. These interventions open an aspirations gap, which encourages forward-looking and focused effort to narrow it. We use this model as a framework for understanding the impacts of our aspirational hope-based intervention among Bolivian dairy farmers.

2.2. Theory of change and testable hypotheses

Within the context of this theoretical framework, we hypothesize a causal pathway from the intervention first to its general effect on aspirations, then toward a more focused effect on goal setting related to the relevant (dairy) activity, subsequently leading to a change in intermediate behaviors stemming from these articulated goals, and then to an improvement in outcomes stemming from the positive change in intermediate behaviors. Thus, we establish four testable hypotheses related to this sequence:

- **Hypothesis A.** The aspirational hope intervention positively affects the three elements of aspirational hope: aspirations, pathways and agency.
- **Hypothesis B.** The aspirational hope intervention positively affects the aspired daily milk production, number of milking cows and daily productivity.
- **Hypothesis C.** The aspirational hope intervention positively affects productivity enhancing practices, milk quality enhancing practices and information gathering practices of dairy farmers.
- **Hypothesis D.** Adoption of enhanced dairy practices as spurred by elevated aspirations leads to overall increases in milk production.

2.3. Heterogeneous treatment effects

We further investigate two heterogeneous treatment effects. Dalton et al. (2016) present a theoretical framework in which poverty may cause a failure to aspire to one’s own potential, even in the absence of binding external constraints. They show that, under the latter condition, aspirations interventions will realize greater changes in aspirations measures precisely among those who fail to aspire. This is the first heterogeneity effect that we aim to test. Alternatively, we conjecture that our effects could be stronger among those who tend, in their actions and decisions, to be driven by intrinsic motives rather than extrinsic incentives. This hypothesis stems from the realization that since our intervention does not alter the framework of external constraints faced by the farmers, it might be more likely to engage those who are driven to act as a result of expected internal rewards, rather than because of external products, pressures, or rewards. Intrinsic motivation and aspirations are closely related but not identical concepts, as the former can be latent also in individuals that are currently trapped into learned hopelessness.

2.4. Study setting and background

Our study takes place in four municipalities of the Aroma province, in the Bolivian Plateau: Ayo Ayo, Patacamaya, Sica Sica and Umala. Aroma is a low-income region where the majority of the population belong to the Aymara indigenous group.

Dairy production is one of the region’s most important economic activities. However, both production and productivity (liters of milk per cow) have stagnated and even decreased during the last decades. In response, some dairy farmers have switched economic activities and others have migrated to urban areas. Different factors are believed to have contributed to the local dairy decline: insufficient access to technical assistance, poor production practices, extreme weather conditions (severe droughts and frosts), and reduced demand of milk in recent years from the large milk buyers that has led to depressed milk prices.

Altogether, these characteristics make the Aroma province a favorable setting to study aspirational hope and productivity, where wide variation in milk productivity implies that large segments of the population remain inside an efficiency frontier. Also, qualitative surveys prior to the intervention revealed that many farmers experience internal psychological constraints, such as difficulties finding solutions to basic problems, conceptualizing new opportunities, and visualizing a pathway to a better future. These constraints have been overlooked in the drive to relieve external

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2 There are several other studies that have incorporated aspirations into formal models, the most well-known being Boglinclos and Ortoleva (2013), Dalton et al. (2016) and Genicot and Ray (2017). See also La Ferrara (2019) for an attempt to develop a unifying framework integrating the models of Dalton et al. (2016) and Genicot and Ray (2017).
constraints among the farmers, such as lack of access to credit. In recent years farmers have become less financially constrained due to the high penetration of microfinance into the rural areas of Bolivia. But while dairy farmers in the region enjoy broad access to microcredit, many do not borrow to finance expansion of their facilities.

3. Experimental design

3.1. Intervention

The intervention to our treatment group consists of three coaching sessions to farmers. Each session includes two main activities: viewing a documentary and participating in three group workshops on aspirational hope.

The documentary “Historias que Inspiran” (Stories that Inspire) is a 15-minute video that presents the inspiring stories of two local farmers and their families who have successfully expanded their dairy operation over the last years. We produced this video specifically for this intervention. We identify these role models with the help of local partners and documented their stories with the help of a local film producing company.2

We developed the content of the workshops based on the previous work by Rojas et al. (2022), adapting it to our particular context. Each workshop focused on different aspects of aspirational hope and was designed to last about 30 min. Appendix 1 shows the full details of each session.

The principal tool we used during the workshop was “the vision tunnel” (see Appendix 1 Fig. 1). This idea is based on the vision road journey created by Oxfam (2014). We tailored the diagram to fit our local context (Fig. 1-i) and gave each farmer a blank hard copy. During the first two workshops, we then asked them to fill it in (Fig. 1-ii) following the logic suggested by Oxfam (2014). Fig. 1-iii shows an example of a diagram created by a farmer.

3.2. Research population

Our research population consists of the milk producers in the Aroma Province in the Bolivian Plateau, a region where dairy production is a leading agricultural activity. In this province, dairy production is concentrated in four municipalities: Ayo, Patacamaya, Sica Sica and Umalua. Dairy farmers sell principally to one of the two large Bolivian milk companies (Delizia or Pil) and/or make and sell cheese. Among this population, we decided to include only farmers who sold milk to one of these two large milk companies (some of them also make cheese as a secondary activity), excluding those farmers only producing cheese. The rationale behind this decision was to work with a sample of farmers that was as homogeneous as possible.

The dynamics between the farmers and each of the two milk-purchasing companies are similar. For instance, farmers haul their milk daily to the delivery point located in their communities, where the milk is then taken by truck to the processing site of one of the companies.3 Every-two weeks, the company pays the farmers for their delivered milk. The companies pay an average price per liter of milk of 3.00 bolivianos. Additionally, farmers have created two associations (an association for the farmers selling to Delizia and an association for the farmers selling to Pil) to represent their mutual interests, apply collectively for available government funds, and purchase inputs in larger scale.

3.3. Implementation and timeline

Facilitators visited each delivery point from the treatment group three times at bi-weekly intervals.4 Appendix 1 Fig. 2 shows the details of our intervention timeline. During the sessions, farmers watched the documentary individually using tablets and headsets. Facilitators carried out the workshop in groups consisting of 3–5 farmers.

In Session 1, facilitators asked farmers to watch the video and identify the aspirations of the role models to get inspired. After discussing the video, they engaged in steps 1–3 of the vision tunnel (see Appendix 1 Fig. 1). They then formulated their own aspirations for their dairy operation, assessed their current situation, and defined the first steps to be taken to realize their aspirations. Farmers either drew or wrote them on the diagram.

The focus of Session 2 was on pathways and agency. Milk producers watched the video documentary again, but this time facilitators asked them to identify the actions that the role models followed to achieve their aspirations, the opportunities they took and the difficulties they faced. Afterwards, they completed steps 4–7 of the vision tunnel, that is, identifying and representing their own actions, opportunities and difficulties, as well as their past successful experiences in order to strengthen their sense of agency.

In Session 3, facilitators first summarized the content of the previous sessions. Then farmers watched the video a third time to identify best practices related to milk production that helped the role models in the video to grow their business.5 Facilitators encouraged farmers to discuss these practices and share their own experiences. At the end of the session, facilitators gave farmers the final version of their diagrams and asked them to hang it in a visible place, so that they would see it frequently in order to keep their formulated aspirations, pathways, and agency central in their minds.

5 When we met the leaders of the local organizations, we were very open about our project and the institutions behind it. We told them that the University of Groningen from The Netherland was leading the project, supported by its local partner INESAD (a Bolivian research institute). We explicitly mentioned that INESAD is an NGO and that it had no link with the government or funders. We also mentioned this to each farmer while we asked them to sign the form of consent before starting the survey.

6 We hired facilitators with backgrounds relevant to this project, e.g., sociologists and agronomists. During their training facilitators carried out a pilot project with milk producers close by, but not within, our chosen study area. These farmers were close enough in similarity to our research population to test our intervention, but far enough away from our study region to avoid contamination.

7 The control group did not receive any intervention. But, to discard any group effects, we did a placebo discussion after the survey. We formed groups of 3–5 farmers and talked about the main problems in the community.

8 While sharing their stories, the role models mentioned some of the pathways they followed to reach their aspirations. Those pathways included implementing best practices. But it is important to note that those best practices are well-known among farmers. In other words, they did not share new information. This said, some of the practices mentioned or shown in the video by the role models are the following: deworming dosage, animal care with veterinarian/technician, feed alfrecho, give mineral salt, administering vitamins and minerals, purchase of improved cattle, aluminum container or plastic drum for milk transfer, cooling milk before taking it to the diary module, visit the fair looking for information on cattle, and inquire information on obtaining credit from a financial institution.

9 After the first and the second sessions, we kept the diagrams to make sure farmers could work on them on the following sessions.
3.4. Sampling and randomization

By randomizing across delivery points, we split the sample in two groups: 26 delivery points in the treatment group and 26 delivery points in control. We randomized by computer following these steps (see Appendix 1 Fig. 3):

1. We pooled all the randomization units: 52 delivery points (Fig. 3-i).
2. We stratified our sample in two groups by milk company (Delizia and Pil) to which delivery points sell milk (Fig. 3-ii).
3. We stratified each of the two strata in four groups by municipality (Ayo Ayo, Patacamaya, Sica Sica and Umalá), and then where delivery points are located (Fig. 3-iii), giving us eight strata.
4. Within each of the eight strata, we ranked the delivery points by its size, that is, by the number of farmers that belong to that delivery point (Fig. 3-iii).
5. Within each of the eight strata, we matched 3 delivery points (see Fig. 3-iv). If there were 2 units left over, we create one pair. If there was 1 unit left over, we created a pair by borrowing 1 unit from the previous triplet. In total, we created twenty triples/pairs.
6. We generated a random number for each delivery point, and within the matched units, we ranked delivery points by random number (Fig. 3-v).
7. We then randomized within matched units, assigning each delivery point to either control or treatment group (Fig. 3-vi).

Our pairwise randomization improves the probability of obtaining balance on key control variables. We matched triplets to mitigate issues related to attrition: In case of paired randomization, if a randomization unit (a delivery point) were to drop out, the remaining unit within the pair would lack a comparison unit and therefore would have to be dropped from the analysis. Creating triplets limits the likelihood of this occurrence.

4. Experimental data

4.1. Data collection

We collected primary data through individual surveys, surveying farmers by tablet software at the milk delivery points. As shown in Table 1 and Appendix 1 Fig. 2, we surveyed both treatment and control groups at baseline (in April, before the first session of the intervention) and at endline (in August-September, three months after the intervention) to estimate the impacts of the intervention. We carried out an additional survey with the treatment group right after the last session of the workshops (in May-June) as a follow-up right after the intervention. Our final subject pool consists of 531 farmers, 283 in the treatment group and 248 in the control group located at 52 different milk delivery points. All of those assigned to the treatment group were compliers with the treatment, but there was some attrition during the three-month study period.

The attrition rate between baseline and endline was 6.59 % over the whole sample: 6.71 % in the treatment group and 6.35 % in the control group. The most common reason for attrition from the sample was migration to different parts of the country, where farmers could not be located in their communities and were not available by telephone. Additionally, very few farmers decided not to participate in the endline survey. Table 2 shows the final sample frame and rates of attrition. We test and discard differential attrition which implies that the attrition is random and the estimates are not biased (see Table A2 in Appendix 2).

4.2. Outcome variables

Table 3 summarizes the four main families of outcomes: aspirational hope, business goals, practices, and milk production, as well as their corresponding outcome variables. To measure aspirational hope, we use three indices—aspirations, pathways and agency—based on Lybbert and Wydick (2018), categories originating from Snyder (1994). We construct each index based on the farmers’ level of agreement with four sentences, from 6 (totally agree) to 1 (totally disagree). The statements included for each index are as follows:

Aspirations index: (1) “It is better to learn to accept the reality of things than to dream of a better future;” (2) “It is better to have aspirations for your family than to accept each day as it comes;” (3) “When one has a dairy business, it is important to set goals;” (4) “I have specific goals and plans for the future growth of my dairy business.”.

Pathways index: (1) “I can think of many ways to get out of a jam;” (2) “There are many opportunities around me that allow me to reach my goals;” (3) “There are lots of ways around any problem;” (4) “When I cannot sell your milk to a buyer, I can use and/or transform it so that it is not lost.”.

Agency index: (1) “I energetically pursue my goals;” (2) “My past experiences have prepared me well for my future;” (3) “My personal effort and that of my family is the main reason for my achievements and successes;” (4) “I often meet the goals that I set for myself.”.

The analysis of the above-mentioned indexes poses two challenges. First, having three separate indexes for aspirational hope induces the issue of multiple hypothesis testing. Second, the coefficients of the absolute values of the indexes are hard to interpret. To address both challenges at once, we construct a standardized aggregated Aspirational Hope Index, following Kling et al. (2007). For each index, we first de-mean and standardize each element and/or transform it so that it is not lost.

To standardize each index such that the control group has mean 0 and standard deviation 1. Finally, we add up the three standardized indexes and standardize once again. The resulting aspirational hope index can be interpreted in terms of standard deviation changes from the control mean at baseline. In what follows, we will present the both the separate indexes as well as the family-wise aggregate index, but in terms of interpreting the overall statistical significance of our results we rely solely on the latter.

Next, we surveyed farmers regarding their aspired daily milk production (in liters) and the number of cows they aspire to have.

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10 Refer to Imai et al. (2009) and Athey and Imbens (2017) for a discussion about the pros and cons of pairwise randomization.

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**Table 1**

<table>
<thead>
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<tr>
<td>Follow-up</td>
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<td>Yes</td>
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<td>Endline</td>
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**Table 2**

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<td>531</td>
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<tr>
<td>Endline</td>
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<td>Attrition rate</td>
<td>6.71 %</td>
<td>6.45 %</td>
<td>6.59 %</td>
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in two years. We construct the productivity variable by dividing the aspired daily produced liters of milk over the aspired number of dairy cows in two years. Note that the manner in which we construct aspired productivity implies that an increase in desired number of cows that is not proportionally matched by an increased aspired milk production will lead to a decrease in (indirectly calculated) aspired productivity. Once again, to address the issue of family-wise multiple hypothesis testing we create an aggregated index of outcomes and outcome variables.

- Aspirational hope
  1. Aspirations index
  2. Pathways index
  3. Agency index

- Business goals
  4. Aspired daily production
  5. Aspired number of cows
  6. Aspired daily productivity

- Best practices
  7. Productivity enhancing practices
  8. Quality increasing practices
  9. Information-seeking behavior

- Milk production
  10. Produced Any Milk in last 3 days
  11. Standardized Milk Production 3-day Average

Table 4 presents summary statistics of our sample at baseline. Among our subjects, 40% of farmers are female. On average they are 48.4 years old (σ = 15.9) and they attended school an average of 7.8 years (σ = 3.8). Farmers have been engaged in dairy farming for an average of 18 years and they use a mean of about 10 ha of their owned land for dairy farming. Sixty percent of these farmers sell their milk to Delizia. On average, farmers have 3 dairy cows and produce a total of 20 L per day, so that the average production per cow in our sample is just under 7 L of milk per day. In the next two years, they aspire to have 8 cows and to produce 69 L of milk every day (29% higher than their current productivity).

Using baseline data from these farmers, we perform a balance test on outcome and controls variables as follows:

\[
X_{0i} = \alpha + \beta T_{ij} + \sum_{k=1}^{K} \mu_{k} \text{Triplet}_{k} + \epsilon_{0i}.
\]

where \(i\) denotes the farmer, \(j\) the delivery point, \(0\) baseline. \(X\) is the vector of variables that were tested; \(T\) is the treatment dummy (1 for treatment group and 0 for control group); \(\text{Triplet}\) is a vector of \(K\) triplet or pair dummies; and \(\epsilon\) is the error term clustered by delivery point. Results in Table 5 show that the treatment and control groups are balanced, that is, there are no statistically significant differences between them. This suggests that the randomization was successful.

### 4.5. Empirical strategy

#### 5.1. Estimation of average treatment effects

We use an ANCOVA approach to estimate the average treatment effects (ATE), which corresponds to the intention to treat (ITT) as well as the local average treatment effect (LATE) since in our experimental context there is full compliance.

We choose the ANCOVA estimator over the difference-in-differences estimator mainly because of the gains in power, which come from exploiting our two rounds of data collection, baseline and endline (McKenzie, 2012). As shown in the specification below, the ANCOVA estimator allows us to control for the outcome variables at baseline.

---

11 We acknowledge that these are self-reported variables which potentially leads to bias due to the noise and measurement errors, but we did not have any other source to obtain these data at the time of study.

12 There is recent discussion in the literature about the relevance of balance tests (Mutz, Pemantle, & Pham, 2019), but we follow the conventional practice of presenting balance test.
Table 5
Balance test.

<table>
<thead>
<tr>
<th>Variables</th>
<th>N</th>
<th>Coefficient</th>
<th>Standard Errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>531</td>
<td>0.41</td>
<td>1.99</td>
</tr>
<tr>
<td>Female</td>
<td>531</td>
<td>0.08*</td>
<td>0.05</td>
</tr>
<tr>
<td>Education years</td>
<td>531</td>
<td>-0.07</td>
<td>0.29</td>
</tr>
<tr>
<td>Total cattle</td>
<td>531</td>
<td>-0.43</td>
<td>0.43</td>
</tr>
<tr>
<td>Aspirations index</td>
<td>531</td>
<td>-0.08</td>
<td>0.2</td>
</tr>
<tr>
<td>Pathways index</td>
<td>531</td>
<td>0.03</td>
<td>0.16</td>
</tr>
<tr>
<td>Agency index</td>
<td>531</td>
<td>-0.17</td>
<td>0.18</td>
</tr>
<tr>
<td>Aspired number of cows</td>
<td>531</td>
<td>-0.57</td>
<td>0.46</td>
</tr>
<tr>
<td>Aspired daily production</td>
<td>531</td>
<td>0.85</td>
<td>5.95</td>
</tr>
<tr>
<td>Aspired productivity</td>
<td>531</td>
<td>0.14*</td>
<td>0.36</td>
</tr>
</tbody>
</table>

Clustered standard errors by delivery point. *** p < 0.01, ** p < 0.05, * p < 0.1.
These regressions include dummies for triplets, but they are not shown in this table.

(2)

\[
Y_{ij} = \alpha + \beta T_{ij} + Y_{0j} + X_{ij}\delta + \sum_{k=1}^{K} \mu_k\text{Triplet}_k + \sum_{m=1}^{M} \mu_m\text{Enum}_m + \epsilon_{ij},
\]

where \(i\) denotes the farmer, \(j\) the delivery point, \(k\) the delivery point triplet or pair, and \(t\) the time (1 for endline and 0 for baseline). \(Y\) is the outcome; \(T\) is the treatment dummy (1 for treatment group and 0 for control); \(X\) is a vector of individual controls including geo-referenced GPS locations (latitude and longitude) as well as all other controls mentioned in section 5.3; \(\text{Triplet}\) is a vector of \(K\) triplet or pair dummies; \(\text{Enum}\) is a vector of \(M\) enumerator dummies at baseline and endline; \(\epsilon\) is the error term clustered by delivery point. We are interested in the coefficient \(\beta\) for the ATE of our aspirational hope intervention. We did not collect data on best practices at baseline, so we will be doing simple post-treatment regressions for those outcomes. This post-treatment regression model, for best practices outcomes is the following:

(3)

\[
Y_{ij} = \alpha + \beta T_{ij} + \delta X_{ij} + \sum_{k=1}^{K} \mu_k\text{Triplet}_k + \sum_{m=1}^{M} \mu_m\text{Enum}_m + \epsilon_{ij},
\]

5.2. Estimation of heterogeneous treatment effects

We also measure the heterogeneous treatment effects (HTE) by differentiating between those farmers who at baseline have a more internal vs external motivation – by gauging their Perceived Locus of Causality (PLOC) – as well as those who do or do not exhibit aspirations failure.

5.2.1. Aspirations failure

Following the theoretical framework by Dalton et al. (2016) we hypothesize that farmers with who are stuck into a condition of aspirations failure will realize greater changes in aspirations measures as a consequence of an aspirations intervention. Specifically, Dalton et al. (2016) refer to a failure to aspire to one’s potential. However, given the complexity of estimating one’s potential precisely, to obtain a definition of aspirations failure we consider the difference between current average milk production and aspired production. We conjecture that a failure to establish even a minimal forward-looking aspiration with respect to greater milk production implies an absence of aspirational capacity (hence, aspirations failure). In this sense, our definition of aspirations failure is different from that of Rojas et al. (2022), who rather perform a heterogeneity test with respect to the level of aspirations at baseline. Instead, we create a dummy with value 1 for all participants that merely aspire to milk production equal or lower to their current average, and zero otherwise.14

5.2.2. Internal motivation

We conjecture that individuals with greater intrinsic motivation may exhibit greater malleability in face of an intervention that doesn’t affect any aspect of their (perceived) external constraints. In other words, since the intervention does not include any additional external push in terms of external constraints, it will plausibly impact aspirations more for individuals who have greater internal motivation traits at baseline: those who can be triggered by the intervention video and workshops to engage in a growth trajectory without further external incentives. To proxy for intrinsic motivation we follow a context-adjusted version of the PLOC index first developed by (Ryan and Connell, 1989). The sum of answers to a series of questions in which respondents indicate their reason to act under different scenarios generate an index. Answers range from motives related to one’s own pleasure and beliefs, to those resulting in action merely due to external enforcement. We re-scale this index to between 0 (most intrinsic) and 1 (most extrinsic).

6. Results

6.1. Average treatment effects of the intervention

Table 6 presents the impact of the intervention for the family of outcomes related to Hypothesis A: Columns 1 to 3 give the average treatment effect (ATE) from our intervention on the separate Aspiration Index, Pathways Index, and Agency Index respectively, in absolute terms. All three the treatment coefficients are positive, with the effect on the Aspirations significant at \(p < 0.05\) and the Pathway Index of borderline significant at \(p < 0.10\). In terms magnitude these effects are best analyzed by standardizing the variables and reporting standard deviation changes, rather than point estimates: the intervention leads to a 0.13\(\sigma\) for Aspirations, 0.19\(\sigma\) for Pathways, and 0.13\(\sigma\) for Agency. Interestingly, these estimates are quite similar in magnitude to those found in Rojas et al. (2021). Finally, in Column 4 we present our key summary result, the aggregated Aspirational Hope Index, where the three standardized indexes are summed standardized with respect to control at baseline. The resulting ATE is significant at \(p = 0.077\), displaying a moderate-sized effect of 0.20\(\sigma\). Thus, while our indexes representing the three components of aspirational hope are individually not always statistically significant, for the aggregate index we do find evidence that our intervention achieved our key intermediate goal—raising aspirational hope.

Next, we present the results for the family of outcomes related to Hypothesis B: Aspirations specifically applied to dairy farming goals. Columns 1–3 of Table 7 show results on the absolute values of the indices. We find that the aspirational hope intervention

\[14\] We use aspired production rather than productivity as a building block of our aspirations failure dummy for three reasons. First, there is a higher likelihood of outliers in productivity. Second, we believe it is more immediate to envision increases in milk production rather than productivity, and that conversely the absence of forward-looking production goals is a good signal of aspirations failure. Finally, the intervention aimed at increasing aspirations towards greater wellbeing through milk production, of which productivity is only one possible pathway—increasing the number of cows being the alternative. Aspired milk production instead encompasses both these objectives.

\[15\] In our ex-ante power calculations (see Appendix 3) we had targeted precisely minimum detectable effect size (MDE) of 0.20 SD. However, we had assumed an intraclass correlation of 0.10 within each collection point cluster (the level at which treatment was provided). The lack of significance at \(p > 0.05\) can be attributed to slight underpowering, both because the effect is exactly at the lower bound of our minimum detectable effect of 0.20 and because the actual intraclass correlation is slightly higher than expected.
increased average aspired daily milk production by a total of 9.1 L (Column 1) and the aspired productivity of each cow by 1.1 L per day (Column 3), both significant at \( p < 0.05 \). The increase in the aspired number of cows has a positive but statistically insignificant point estimate of 0.36. Column 4 once again presents an aggregated index, this time of Standardized Business Goals, showing an increase from the intervention of 0.204, very close to the impact on our Aspirational Hope Index and significant at \( p < 0.01 \).

In Table 8 we present the effect of the intervention on the family of outcomes related to Hypothesis C: Adoption of best practices. A further intermediate step to increased dairy production is that generally higher levels of aspirational hope and aspirations directed toward a farmer’s dairy operation specifically should initiate a movement to adopting best practices at the farm level. Here we use a simple post-estimation approach, as good practice variables were collected only at endline. Again Columns 1–3 present the raw outcomes of each separate best-practices index. While results fail to show a significantly positive impact on productivity-enhancing and information-seeking practices (Columns 1 and 3), the intervention appears to have had a very strong effect on quality-enhancing practices (Column 2). Our index of quality-enhancing practices increases quite dramatically in the treatment group, by 1.07σ when standardized, significant at \( p < 0.05 \). Column 4 presents the effect on the aggregated and standardized Best Practices Index, which shows an ATE of 0.13σ with borderline statistical significance at \( p = 0.10 \). It is likely that the quality-enhancing practices display the strongest effect in our three-month study window because these may have been the easiest adjustments for dairy farmers to make relative to changing practices to increase information gathering or the quantity of milk output in their dairy operations.

Finally, we examine Hypothesis D, the impacts of the intervention on milk production three months after our intervention. Due to seasonal variation in moving from the fall to the winter months in Bolivia, milk production declined across the sample during the study period from a three-day average of 20.9 L to 16.8 L in the control group (−4.1 L). In the treatment group it fell from an average of 20.0 L to only 16.6 L (−3.4 L), a raw difference-in-differences outcome of + 0.7 L for the treatment group, a statistically insignificant increase based on a simple two-tailed t-test (\( p = 0.35 \)). While
prises in their sample from Oaxaca, Mexico. They are also more likely and aspirational outcomes than they do on the microenterprise outcomes.

We were unable to retrieve GPS coordinates for two participants. For them, we take the average latitude and longitude of other people in their collection point. The results are virtually unchanged if we instead exclude them from the analysis.

Table 8
Treatment effects on Best Practices.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Productivity Enhancing Practices</th>
<th>(2) Quality Enhancing Practices</th>
<th>(3) Information Gathering Practices</th>
<th>(4) Standardized Best practices Index (combined)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>0.291</td>
<td>0.445**</td>
<td>−0.0913</td>
<td>0.129*</td>
</tr>
<tr>
<td>Individual controls</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Spatial controls</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Stratification f.e.</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Enumerator f.e.</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Observations</td>
<td>496</td>
<td>496</td>
<td>496</td>
<td>496</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.395</td>
<td>0.446</td>
<td>0.280</td>
<td>0.456</td>
</tr>
</tbody>
</table>

Clustered standard errors by delivery point (52). *** p < 0.01, ** p < 0.05, * p < 0.1. In Columns 1–3 we present the raw separate measures for Productivity Enhancing, Quality Enhancing, and Information Gathering Practices respectively. In Column 4 we adjust the three measures based on Kling et al. (2007); each measure is demeaned and standardized (to control group at baseline). To create the combined index of Column 4, we then add up the three standardized measures and then standardize resulting variable to the mean and SD of the control group at baseline. All regressions include the set of controls specified in section 5.3, longitude and latitude coordinates to capture spatial effects, stratification dummies for triplets and enumerator fixed effects. These are not included in this table for presentations purposes. We were unable to retrieve GPS coordinates for two participants. For them, we take the average latitude and longitude of other people in their collection point. The results are virtually unchanged if we instead exclude them from the analysis.

Table 9
Treatment Effects on Milk Production.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Produced Any Milk in last 3 days</th>
<th>(2) Standardized Milk Production 3-day Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>0.0335*</td>
<td>−0.0393</td>
</tr>
<tr>
<td>Baseline outcome value</td>
<td>0.430**</td>
<td>0.280***</td>
</tr>
<tr>
<td>Individual controls</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Spatial controls</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Stratification f.e.</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Enumerator f.e.</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Observations</td>
<td>496</td>
<td>496</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.228</td>
<td>0.619</td>
</tr>
</tbody>
</table>

Clustered standard errors by delivery point (52). *** p < 0.01, ** p < 0.05, * p < 0.1. In column 1 the outcome variable is a dummy taking value of 1 if the respondent had produced any milk in the past three days. In column 2 we adjust raw milk production based on Kling et al. (2007): each measurement is demeaned and standardized (to control group at baseline). All regressions include the set of controls specified in section 5.3, longitude and latitude coordinates to capture spatial effects, stratification dummies for triplets and enumerator fixed effects. These are not included in this table for presentations purposes. We were unable to retrieve GPS coordinates for two participants. For them, we take the average latitude and longitude of other people in their collection point. The results are virtually unchanged if we instead exclude them from the analysis.

6.2. Intention to treat effects on milk rejection rates

Since we find evidence for increases in both aspirations for improving dairy operations as well as adopting best dairy practices, the weak results from the intervention on milk production may seem surprising. Nevertheless, there are a few potential explanations for this. One possibility may be that the aspirations intervention produced psychological effects with some effects on behaviors, but failed to sink deep enough to ensure that these psychological changes and modest changes in behaviors resulted in actual changes in production. Another reason may be that the intervention only had an effect on those with very low levels of productivity, where we do find significant evidence of a decline in the number of dairy farmers with zero output in the three days before the survey. Finally, a likely possibility is that heightened aspirations in the end led farmers to focus on improving the quality of their milk rather than the quantity, which is consistent with our finding that the intervention only affected best practices related to enhancing quality rather than quantity. While we only have data on practices related to quality (which as we saw, improved considerably), and not milk quality itself, a main reason for dairy farmers not to collect milk from their own cows is that these cows have an infirmity, such as mastitis, that would lead to a rejection of the milk. In fact, at baseline, over 40% of respondents had witnessed their milk being rejected at least once either because of the presence of foreign matter, or because of wrong levels of density or acidity of their milk. It is possible that the reported lower likelihood of zero milk production in the three days prior is a result of the higher quality practices undertaken by treatment farmers.

To further probe this line of reasoning, after the endline data had been collected we reached out to one of the two milk aggregators, who agreed to share data on daily milk rejection rates for the month of June 2019, the most recent data that was available at the time after the intervention had taken place. We compared this to daily rejection rates for June 2018—well before the intervention took place. We chose to compare the same month over two years to better take care of seasonal variations in milk rejection rates. We were unable to retrieve GPS coordinates for two participants. For them, we take the average latitude and longitude of other people in their collection point. The results are virtually unchanged if we instead exclude them from the analysis.

ANCova estimates in Table 9 show a borderline significant effect (p = 0.09) from the intervention on a dummy variable representing whether any milk was produced in the last 3 days, the coefficient on the three-day average production prior to the survey is negative and statistically insignificant. As a result, we cannot find strong evidence of an overall increase in milk production three months after the intervention.

The insignificant impacts we find on output enterprise outcomes somewhat parallel those found in other recent work such as Rojas et al. (2022), who find much bigger effects on psychological and aspirational outcomes than they do on the microenterprises in their sample from Oaxaca, Mexico. They are also consistent with recent results from Orkin et al. (2021), from an experiment in Kenya that cross-cuts a cash transfer with an aspirations intervention, where elevated aspirations had effects on children's schooling outcomes but no significant effect on household enterprise outcomes.

We probe the correlation between practices and milk production in Table A1 in Appendix 1. We find that quality enhancing practices correlate weakly with greater productivity, and very significantly with greater likelihood of producing any milk. This correlation is unaffected by treatment status. Importantly, information seeking and productivity enhancing practices never correlate with production measures nor with the likelihood of having produced any milk. We interpret this as suggestive that farmers identified quality practices as the most effective pathway to increase production (or at least increased probability of milk not being rejected).

16 We probe the correlation between practices and milk production in Table A1 in Appendix 1. We find that quality enhancing practices correlate weakly with greater productivity, and very significantly with greater likelihood of producing any milk. This correlation is unaffected by treatment status. Importantly, information seeking and productivity enhancing practices never correlate with production measures nor with the likelihood of having produced any milk. We interpret this as suggestive that farmers identified quality practices as the most effective pathway to increase production (or at least increased probability of milk not being rejected).
production, which might differ by area or individual. It is important to state that this analysis was not part of the initial pre-analysis plan.¹⁷

Since the data is anonymised, we are only able to perform intent to treat (ITT) estimates, without knowing for certain if the data includes people that completed our workshop sessions or not. This said, the dataset does contain unique IDs that allow us to match each individual across the two datasets, as well as information on the dairy module to which each ID belongs—which allows us to assign treatment and control status, since treatment was randomised at the module level. This allows us to perform an ITT fixed effects panel estimation on the subsample of 293 dairy farmers over the 60 days for which we obtained rejection data.

Table 10 shows the results of such analysis in columns 1 and 2. In both cases we cluster standard errors at the module level, and add day of the week and day of the month fixed effects in column 2, to control for systematically lower rejections, for example, on Saturdays and towards the end of the month. In both cases the constant, representing rejection rates in the absence of treatment, hovers around 3–4 %, Treatment reduces this substantially, with rejection rates dropping by around 2.8 percentage points, or 0.16σ, highly significant at conventional levels. In columns 3–5 we further probe which of the specific reasons for rejection are reduced by treatment. The data allows us to separate four reasons: acidity, temperature (not cold enough), solid matter in the milk, and excess dirt. As can be seen, the majority of the effect is explained by a drop in rejections due to milk acidity, and to a lesser extent to wrong temperature. Presence of solid matter (column 5) instead increases significantly, but it’s incidence remains relatively very low. All in all, these results are coherent with efforts from the side of treated farmers to increase the quality of the milk delivered. While the overall milk production may not have increased, it is plausible that these reduced rejection rates may have some income effects, too.¹⁸

6.3. Heterogeneous treatment effects of the intervention

In Table 11 we explore potential moderators that may have rendered the intervention more or less effective for specific subgroups of our sample. In Columns 1–3 we present the treatment effects on the aggregated indices for the first three families of outcomes, interacted with aspirations failure, and in Column 4 the effects standardized index of milk production. As mentioned, we hypothesize that the intervention could have a greater effect on those that have a relatively greater difficulty in having a healthy level of aspirations above their status quo. In all three cases, the treatment coefficients are virtually unchanged by controlling for aspirations failure. However, aspirations failure seems to have a negative effect on aspirational hope, and its interaction with treatment is significantly positive (Column 1). Participants that fail to aspire however do not seem to be able to take advantage of the intervention in terms of their aspired business goals: in this case the interaction term is significantly negative (Column 2). Finally, aspirations failure does not seem to influence the likelihood of applying good farming practices (Column 3) or production (Column 4). We interpret these mixed results as not particularly indicative that ex-ante aspirations failure – at least in the way we define it – is a driver of intervention success.

Alternatively, we hypothesized that intrinsic motivation could play a role in lifting aspirations as a result of our intervention. In fact, our intervention does not provide any material relief or support in achieving any of the goals that are inherent to dairy production, and it is therefore possible that only participants with a sufficiently intrinsic motivation would find the energy and enthusiasm to transform the concepts of the workshops into actual aspirational changes. Our Perceived Locus of Causality (PLOC) continuum, which we employ takes a value of 0 for the most intrinsically motivated and 1 for the most extrinsically motivated. When we control for baseline PLOC, Columns 5 through 8 show that coefficients on treatment increase in size and significance. The interaction term with PLOC is also negative, as expected—for those with the most intrinsic motivation (i.e., PLOC = 0), the treatment effect is much larger: aspirational hope increases by a statistically significant 0.59σ, business goals by 0.45σ and best practices by 0.28σ, while production by a statistically insignificant 0.11σ. Thus, it appears that to the extent the intervention was effective, it was mainly effective on those with strong intrinsic motivation, whereas effects on those with extrinsic motivation are actually negative, although statistically insignificant.

Column 9 further aggregates the indexes of outcomes into an overall index. This last model thus distills the overall impact of our aspirations intervention into a single outcome variable. In this final regression we include both aspirations failure and PLOC interacted with treatment. For participants that do not exhibit aspirations failure at baseline, and a PLOC of zero, we find that treatment increases the overall index by above 0.5σ (p = 0.006). Aspirations failure has a significant negative effect on the overall index, but the interaction term with treatment is positive but insignificant.¹⁹ On the other hand, PLOC seems to be unrelated to the overall outcome index when observed as a standalone, but at higher PLOC levels (more extrinsic motivation) the treatment effect reduces and even becomes negative. We interpret this as consistent with the hypothesis that intrinsic motivation has a moderating effect on the effectiveness of our intervention, and that hope interventions are most effective for those that are intrinsically driven in their motivations at baseline.

7. Summary and concluding remarks

We present results from an evaluation of an aspirational hope intervention among dairy farmers in Bolivia, where other interventions such as microcredit and infrastructure have significantly addressed external constraints, but where high rates of poverty remain. We hypothesize that one component of persistent poverty in the region may originate from internal constraints that remain binding.

Our intervention sought to elevate aspirational hope, decomposed into aspirations, pathways, and agency. We expected our intervention to elevate in turn, general aspirational hope, the aspirated level of productivity (defined as daily liters of milk per cow), and aspirated levels of dairy cattle, increased utilization of best dairy practices, and dairy production. We test whether the intervention resulted in changes in best practices for dairy farming, which we disaggregate into productivity enhancing practices, quality enhancing practice, and information gathering practices. We also examine increases in milk production. Our study period involves a three-month window between the intervention and our follow-up study.

Taken together our results show that our intervention had a moderate effect on aspirational hope. It had a stronger effect on

¹⁷ We thank the anonymous reviewers for encouraging us to seek further data on milk rejection rates.

¹⁸ Assuming no change in produced quantities and no additional costs, an average production of 20 L produced and a price of 3 bolivianos per liter of milk, a very rough back of the envelope calculation would imply that a reduction of rejections of 2.8 percentage points increased income by 50 bolivianos (around 7.2 USD) in the month of June alone.

¹⁹ Note that the combination of level and interaction effects yield a positive but insignificant effect.
Intent to Treat Effects on Milk Rejections.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Rejected</th>
<th>(2) Rejected</th>
<th>(3) Acidity</th>
<th>(4) Temperature</th>
<th>(5) Solid</th>
<th>(6) Dirt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>-0.0283</td>
<td>-0.0283</td>
<td>-0.0279**</td>
<td>-0.00221*</td>
<td>0.00305</td>
<td>-0.00126</td>
</tr>
<tr>
<td>(0.00484)</td>
<td>(0.00488)</td>
<td>(0.00465)</td>
<td>(0.00122)</td>
<td>(0.00127)</td>
<td>(0.00096)</td>
<td></td>
</tr>
<tr>
<td>Day of the month f.e.</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Day of the week f.e.</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>Constant</td>
<td>0.0335**</td>
<td>0.0453**</td>
<td>0.0393**</td>
<td>0.00290*</td>
<td>0.000853</td>
<td>0.00219*</td>
</tr>
<tr>
<td>(0.00126)</td>
<td>(0.00381)</td>
<td>(0.00356)</td>
<td>(0.00128)</td>
<td>(0.00150)</td>
<td>(0.000809)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>17,580</td>
<td>17,580</td>
<td>17,580</td>
<td>17,580</td>
<td>17,580</td>
<td>17,580</td>
</tr>
<tr>
<td>Individuals</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
<td>293</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.0043</td>
<td>0.0083</td>
<td>0.0087</td>
<td>0.0009</td>
<td>0.0019</td>
<td>0.0011</td>
</tr>
</tbody>
</table>

Clustered standard errors by delivery point (29). *** p < 0.01, ** p < 0.05, * p < 0.1. All results are robust to correcting for the small number of clusters. All outcome variables are dummies taking value of 1 if rejected (for a specific reason in columns 3–6).

The positive effects we do see in our results related to practices to increase milk quality are very likely related to the high rate of rejection of milk by the two dairy aggregator companies in the area, PIL and Delizia. As mentioned before, over 40% of respondents witnessed their milk being rejected. Farmers in the treatment group may have found that improving milk quality could therefore be seen as the most straightforward and logical way to increase profits. This could also be reflected by the increased likelihood of positive production in the days prior to the end-line survey. In fact, while the milk production variable we use is defined as any milk produced, including milk that eventually was rejected by the aggregator, it is possible that respondents did not report milk that they themselves discarded due to poor quality. For a non-random subsample of our experimental population, we were able to confirm an increase in the quality of milk delivered to the aggregators, using administrative data. We find significantly lower rejection rates among treated farmers, explained mostly by reduced rejections due to excessively high milk acidity levels. While we are aware of the limitations of this ex-post analysis based on anonymized administrative data (which forces us to use intention to treat estimates), we believe that this evidence is at least suggestive of a factual implication of the increased effort that treatment farmers claim to have put towards improving their milk quality. This in turn, may have had implications on milk-generated incomes even in the absence of observable increases in productivity.

The fact that our endline survey took place three months after the intervention represents one potential shortcoming of our study. While the possibility of a further follow-up survey was rendered impossible – first by the Bolivian electoral cycle and the tensions that followed it in the fall of 2019, and then...
by the COVID-19 pandemic – our timeline was sufficient to observe significant changes in aspirations and best practices. Because the intervention clearly appears to have motivated dairy farmers in the treatment group to increase milk quality instead of quantity, we view long-term increases in output as unlikely conditional on the null results on average production we find three months after the intervention. If best practices for increasing production were not implemented within this timeframe, we view it as unlikely that they would be implemented by the treatment group afterward. Moreover, our aspirations intervention intentionally included some elements of role models encouraging best practices for dairy farming in the region. As such we would have even more reason to expect effects on output, and we view the fact that we do not see this clearly in our data by the three-month endline suggests to us that responses to the intervention appear to have focused only on quality improvements and that we would be unlikely to yield increases in milk output over a longer timeframe.

One potential strength of this study is that key results appear to be congruent with other recent results of aspirations interventions such as Rojas et al., (2021) and Orkin et al. (2021), who also find aspirations interventions to significantly affect psychological variables related to enterprises, but who also find relatively modest effects from an aspirations intervention on actual enterprise outcomes. Seen in light of other contexts in which aspirations interventions have been implemented, there appears to be stronger support for the effect of aspirations interventions in contexts where aspirations may be more malleable, such as in applications to children’s education (Bernard et al., 2014; Ross et al., 2021; Bahn, 2020; Orkin et al., 2021).
Our experimental results also point towards the importance of intrinsic motivation in shaping the outcome of similar hope interventions. Previous work such as Riley (2017) and Rojas et al. (2022) find in the context of aspirations interventions in education and microenterprise, respectively, that those with lower baseline outcomes and aspirations benefited more from the intervention. In contrast, in our sample those with greater intrinsic motivation (related to baseline aspirations) responded significantly more to the intervention, in terms of aspirational hope, business goals, best practices, and our overall impact index. This result will require further research, but if confirmed it may have important implications for behavioral economic theory as well as policy. In terms of our theoretical understanding, the relationship between (intrinsic) motivation and aspirations remains unclear in economics, and this paper provides some evidence that aspirations appear to drive behavior through building on a foundation of intrinsic motivation. In terms of practical policy implications, this result may help to target aspirations interventions to those who stand to benefit the most from them, while other types of interventions may be more beneficial for those who tend to rely more on external incentives.
CRediT authorship contribution statement

Francesco Cecchi: Conceptualization, Formal analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. Adriana Garcia: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Visualization, Writing – original draft, Writing – review & editing. Robert Lensink: Conceptualization, Funding acquisition, Methodology, Project administration, Resources, Supervision, Writing – original draft, Writing – review & editing. Bruce Wydick: Conceptualization, Writing – original draft, Writing – review.

Data availability

Data will be made available on request.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We acknowledge the help of a great team of enumerators, coordinated by a wonderful team at INESAD. We are thankful for the interest and availability that the farmers associations and milk aggregators showed in our work, and for the support provided by Sembrar-Sartawi. In particular Victor, who helped us understand the intricacies of local milk production. Finally, we would like to thank two anonymous reviewers for their comments and suggestions.

Appendix 1

Table A1. Correlation Between Practices and Milk Production.

<table>
<thead>
<tr>
<th></th>
<th>(1) Produced Any Milk in last 3 days</th>
<th>(2) Produced Any Milk in last 3 days</th>
<th>(3) Standardized Milk Production 3-day Average</th>
<th>(4) Standardized Milk Production 3-day Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity Enhancing</td>
<td>−0.00169</td>
<td>−0.00130</td>
<td>0.0119</td>
<td>−0.00586</td>
</tr>
<tr>
<td>Practices</td>
<td>(0.00398)</td>
<td>(0.00406)</td>
<td>(0.0227)</td>
<td>(0.0197)</td>
</tr>
<tr>
<td>Quality Enhancing</td>
<td>0.0160***</td>
<td>0.0196**</td>
<td>0.0327</td>
<td>0.0199*</td>
</tr>
<tr>
<td>Practices</td>
<td>(0.00533)</td>
<td>(0.00561)</td>
<td>(0.0123)</td>
<td>(0.0114)</td>
</tr>
<tr>
<td>Information Gathering</td>
<td>0.00215</td>
<td>−0.000774</td>
<td>0.0241</td>
<td>−0.00508</td>
</tr>
<tr>
<td>Practices</td>
<td>(0.00496)</td>
<td>(0.00430)</td>
<td>(0.0241)</td>
<td>(0.0202)</td>
</tr>
<tr>
<td>Treatment</td>
<td>0.0271</td>
<td>0.0205</td>
<td>−0.0504</td>
<td>−0.0786</td>
</tr>
<tr>
<td></td>
<td>(0.0327)</td>
<td>(0.0250)</td>
<td>(0.151)</td>
<td>(0.0631)</td>
</tr>
<tr>
<td>Treatment × Prod</td>
<td>0.00765</td>
<td>0.00373</td>
<td>0.0338</td>
<td>0.0122</td>
</tr>
<tr>
<td></td>
<td>(0.00557)</td>
<td>(0.00487)</td>
<td>(0.0257)</td>
<td>(0.0223)</td>
</tr>
<tr>
<td>Treatment × Qual</td>
<td>−0.00734</td>
<td>−0.00657</td>
<td>−0.0331*</td>
<td>−0.0169</td>
</tr>
<tr>
<td></td>
<td>(0.00824)</td>
<td>(0.00728)</td>
<td>(0.0161)</td>
<td>(0.0122)</td>
</tr>
<tr>
<td>Treatment × Info</td>
<td>−0.0131</td>
<td>−0.00870</td>
<td>−0.00192</td>
<td>0.0136</td>
</tr>
<tr>
<td></td>
<td>(0.00854)</td>
<td>(0.00764)</td>
<td>(0.0297)</td>
<td>(0.0240)</td>
</tr>
<tr>
<td>Controls</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Spatial controls</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Stratification f.e.</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Enumerator f.e.</td>
<td>no</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Observations</td>
<td>496</td>
<td>496</td>
<td>496</td>
<td>496</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.122</td>
<td>0.322</td>
<td>0.0799</td>
<td>0.580</td>
</tr>
</tbody>
</table>

Clustered standard errors by delivery point (52). *** p < 0.01, ** p < 0.05, * p < 0.1.

Appendix 2. Attrition

We test for differential attrition as follows:

\[ A_{ij} = x + \beta T_{ij} + X_i \delta + \sum_{k=1}^{K} \mu_k \text{Triplet}_k + \varepsilon_{ij}. \]  

where \( i \) denotes the farmer, \( j \) the delivery point, \( k \) the delivery point triplet or pair, and \( t \) the time (0 for baseline). \( A \) is the attrition dummy (1 for those who were not surveyed in endline and 0 otherwise); \( T \) is the treatment dummy (1 for treatment group and 0 for control); \( X \) is a vector of individual controls including georeferenced GPS locations (latitude and longitude) as well as all other controls mentioned in section 5.3; \( \text{Triplet} \) is a vector of \( K \) triplet or pair dummies; \( \varepsilon \) is the error term clustered by delivery point. We are interested in the coefficient \( \beta \) for the ATE of our aspirational hope intervention.

Table A2 shows that neither the treatment variable nor the control variables are significant, which implies that attrition is random and there is no selection bias.

Table A2. Differential Attrition Test.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Attrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment</td>
<td>−0.00316</td>
</tr>
<tr>
<td></td>
<td>(0.0199)</td>
</tr>
<tr>
<td>Age</td>
<td>−0.00611</td>
</tr>
<tr>
<td></td>
<td>(0.00490)</td>
</tr>
<tr>
<td>Age squared</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>0.0145</td>
</tr>
<tr>
<td></td>
<td>(0.0343)</td>
</tr>
<tr>
<td>Education years</td>
<td>−0.000920</td>
</tr>
<tr>
<td></td>
<td>(0.00402)</td>
</tr>
<tr>
<td>Observations</td>
<td>531</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.062</td>
</tr>
</tbody>
</table>

Clustered standard errors by delivery point. *** p < 0.01, ** p < 0.05, * p < 0.1.

These regressions include dummies for triplets, but they are not shown in this table.
Appendix 3. Power analysis

We estimate the minimum detectable standardized effect size (MDES) as follows:

\[ MDES = \left( t_a + t_{1-\beta} \right) \times \sqrt{\frac{1}{P(1-P)N}} \]  \hspace{1cm} (A2)

where \( \alpha \) is the significance level, \( 1 - \beta \) is the power; \( P \) and \( 1 - P \) are the shares of the sample assigned to the treatment group and the control group, respectively; and \( N \) is the sample size.

Because our randomization is clustered, we need to adjust the MDES with the intra-cluster correlation. To do so, we multiply the MDES by the design effect (DE), which is calculated as follows:

\[ DE = \sqrt{1 + (n - 1)\rho} \]  \hspace{1cm} (A3)

where \( n \) is the number of units per cluster (\( J \)) and \( \rho \) is the intra-cluster correlation.

Table A3 shows the value of each parameter and the adjusted MDES with DE for our three primary outcomes.

### Table A3

<table>
<thead>
<tr>
<th>Aspirations Index</th>
<th>Pathways Index</th>
<th>Agency Index</th>
<th>Aspired daily prod.</th>
<th>Aspired num. of cows</th>
<th>Asp. daily productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \alpha )</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>( \beta )</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
<td>0.8</td>
</tr>
<tr>
<td>( t_a )</td>
<td>1.645</td>
<td>1.645</td>
<td>1.645</td>
<td>1.645</td>
<td>1.645</td>
</tr>
<tr>
<td>( t_{1-\beta} )</td>
<td>0.842</td>
<td>0.842</td>
<td>0.842</td>
<td>0.842</td>
<td>0.842</td>
</tr>
<tr>
<td>( P )</td>
<td>0.533</td>
<td>0.533</td>
<td>0.533</td>
<td>0.533</td>
<td>0.533</td>
</tr>
<tr>
<td>( 1-P )</td>
<td>0.467</td>
<td>0.467</td>
<td>0.467</td>
<td>0.467</td>
<td>0.467</td>
</tr>
<tr>
<td>( N )</td>
<td>531</td>
<td>531</td>
<td>531</td>
<td>531</td>
<td>531</td>
</tr>
<tr>
<td>MDES</td>
<td>0.216</td>
<td>0.216</td>
<td>0.216</td>
<td>0.216</td>
<td>0.216</td>
</tr>
<tr>
<td>( J )</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
<td>52</td>
</tr>
<tr>
<td>( n )</td>
<td>10.212</td>
<td>10.212</td>
<td>10.212</td>
<td>10.212</td>
<td>10.212</td>
</tr>
<tr>
<td>( \rho )</td>
<td>0.073</td>
<td>0.046</td>
<td>0.064</td>
<td>0.05</td>
<td>0.043</td>
</tr>
<tr>
<td>DE</td>
<td>1.292</td>
<td>1.193</td>
<td>1.259</td>
<td>1.353</td>
<td>1.181</td>
</tr>
<tr>
<td>Adj. MDES with DE</td>
<td>0.279</td>
<td>0.258</td>
<td>0.272</td>
<td>0.293</td>
<td>0.256</td>
</tr>
</tbody>
</table>

Appendix 4. Coaching sessions

### Workshop 1: Aspirations

#### Workshop objectives
- Identify aspirations on milk production.
- Define the first steps to achieve aspirations.

Introduction.

- Greet and introduction.

Hello, my name is ___. We represent INESAD and the University of Groningen. We are carrying out a project on personal growth to improve dairy and agricultural productivity. I will guide you throughout the process of personal growth and information search that you may need to increase your productivity. I will start by collecting some information and then we will proceed to the workshop with the rest of the group.

#### Part 1: Survey

Approximate time per person: 10 min

The role of facilitators/enumerators 1 and 2 will alternate each workshop.

- He/she will focus on conducting surveys to dairy farmers.

Facilitator/Enumerator 1.

- In addition to conducting surveys, he/she will be responsible for logistical aspects, for example, looking for farmers who have not arrived at the meeting point.

Part 2: Video

Approximate time: 15 min

Facilitator/Enumerator 1.

- Form groups of 3–5 farmers to start the group activity.
- Talk about the objective and the activities that will be carried out during the session.

Thank you very much for your presence. During this workshop, my partner and I will guide you in your personal growth with the ultimate goal of improving your productivity in the agricultural activities you carry out, especially milk production. As part of personal growth, we will focus on identifying your aspirations. Aspirations are a desire to achieve something in the future or achieve well-being with regard to its dairy and agricultural production. We believe it is very important to start by identifying aspirations because they allow each person to define where they want to go in life, and knowing where they want to go and that they want to achieve is the first step to success. To do this, we will carry out two activities together. First, we will watch a video and then we will work on identifying your own aspirations individually.

- Introduce the video.

The video that you will watch in the tablet presents the life of two dairy farmers who live in the Aroma province, like you. Please, while watching the video focus on identifying the aspirations these farmers have.

Facilitator/Enumerator 2.

- Get the video ready on each tablet to play (including headphones). If necessary, create teams of two farmers and assign each pair 1 electronic tablet with the video ready to play and 2 headphones.

Part 3: Reflection

Facilitator/Enumerator 1.
• At the end of the video, ask the farmers for their opinion on the video.

Would like to ask what you think about the video.

• Allow 2–3 people to give a brief opinion (maximum 5 min). If people don’t participate, ask more direct questions like do you like the video? why?

• Help farmers identify examples of aspirations in the video.

Of the two stories you saw in the video, what aspirations can you identify in the case of Celso, Silvano and their wives? Please feel free to share your ideas with the group.

• Allow farmers to speak openly in the group. Let them know that there are no right or wrong ideas, to encourage participation. If someone gives an example that is not directly related to an aspiration, help the person rethink the idea. For example, if a person says that Julia’s aspiration is that she loves animals and lives in the country. You can ask questions that help farmers reformulate the idea by saying: what can you do if you live in the countryside and you like animals? Answer: have a barn for your cows because they suffer a lot in cold weather.

• After the farmers shared examples, if necessary, supplement the aspirations using the following ideas.

Celso Condori: Build barn, build milking parlor and get milking machine (min 10:43).
Julia Flores: Want to progress, get a cheese factory and a kitchen (min 10:50), build a barn for cows because in cold weather the cattle suffer (min 11:06).
Silvano: win the contest for the best bull at the Umala fair (min 9:55), get a milking machine in 2 years (min 11:14), get more loans and expand both milk and cheese production, have a cheese farm (min 11:23).

• Help farmers to identify their own aspirations for their dairy and agricultural production.

As you can see in the video, each story is different and each person has different aspirations. The stories we present are just one example. Now we would like to focus on you. We believe that you also have your own aspirations and I, as your guide, will help you identify them.

Focusing on your dairy and agricultural production, reflect on:

• What is it that you dream about?
• What do you want to achieve?
• How do you and your family see yourselves in the next 2 years?
• Where would you like to be in 2 years?

For now, do not think whether your aspirations are easy or difficult to achieve, whether there are obstacles or opportunities to achieve this. For now, you just have to think about what you want to achieve in 2 years and later I will guide you to draw up a plan on how to achieve your aspirations. Remember that aspirations are personal, that is, every-one can have different aspirations. Also remember that there are no big or small aspirations. The important thing is to have aspirations because that way you know where to go in the future and that is the first step to success.

Facilitator/Enumerator 2.

• Give each farmer a pencil and paper with the vision tunnel diagram.

Facilitator/Enumerator 1.

• Help farmers represent their aspirations in a drawing using the provided material.

Once you have thought about your aspirations, I would like to ask you to choose the most important or main aspirations (2 or 3) and draw them inside the circle at the top of the paper. You can represent them using symbols, shapes or letters. This drawing will be just for you, so it does not have to be perfect, it just has to be clear to you every time you look at it.

Facilitator/Enumerator is 1 and 2.

• Walk around and try to identify people’s aspirations. If necessary, ask them again individually what their aspirations, wishes and dreams are about dairy and agriculture production.

• Offer your help to draw or write if they have difficulties. For example, if a picture is not clear, you can help him write a word that identifies it.

• Make sure each person has 2–3 aspirations, but be flexible if someone decides to have 1 or 10.

• Keep information about aspirations private, but if there are people who want to share, give them the freedom to share them as well.

Facilitator/Enumerator 1.

• Help farmers to reflect on their current situation.

Now that each of you identified your main aspirations, we would like you to reflect on your current situation about dairy and agricultural production. How is your current situation? As a reference, you can keep the aspirations you identified in mind and compare them to your current situation. Later, we will talk about how to achieve the desired situation.

Facilitator/Enumerator is 1 and 2.

• Help farmers represent their current situation in a drawing using the provided material.

As you did with aspirations, represent your current situation within the circle at the bottom of the paper. You can represent it using symbols, figures or letters. Likewise, this drawing will be just for you, so it doesn’t have to be perfect, it just has to be clear to you every time you look at it.

Facilitator/Enumerator is 1 and 2.

• Walk around and try to identify the current situation of the people. If necessary, ask them individually. Offer your help to draw or write if they have difficulties. For example, if a picture is not clear, you can help him write a word that identifies it.

• Keep the information private, but if there are people who want to share, give them the freedom to do so as well.

Facilitator/Enumerator 1.

• Make a group reflection on the first steps, small actions, that can be done in the short term to reach the desired situation. Lead this group reflection based on the aspirations and current situations identified during the previous activities.

So far, you have identified your current and desired. As your drawing represents, there is a way to walk towards your
Workshop 2: Pathways and agency

Workshop objectives

- Visualize and identify the pathways to achieve aspirations.
- Strengthen agency on your skills to achieve aspirations.

Introduction.

Greeting and introduction

Hello, my name is ___. We are back to follow up on our first visit and to carry out the second workshop. During the previous session, we talked about your aspirations. During today’s session, we will focus on the pathways or routes to achieve your aspirations and strengthen your agency. We will carry out three activities: (1) we will briefly recap what we did in the first workshop, (2) we will watch the video again, and (3) we will work on visualizing your own pathways according to your aspirations and strengthen your agency.

Part 1: Recap of the first workshop

- Form groups of 3–5 farmers to start the group activity.
- Give each person his/her diagram and give a moment to look at it and remember what you have drawn or written.

We will start by recalling your aspirations and your current situation that you represented in your diagram. Take a moment to look at your diagram.

- Talk about the first action they defined to reach their aspirations.

Now we will focus on the first step that you defined to get from your current situation to your aspirations. This step was a concrete action. I would like to ask you if you did it or not and if you faced any difficulties.

- Talk about what will be done in the rest of the workshop.

During this workshop, we will identify the next actions (steps) that you need to take to achieve their aspirations. But first we will watch again the video of the previous workshop.

Part 2: Video

Approximate time: 15 min

- Introduce the video

The reason why we ask you to watch it again is because this time we want you to focus on identifying the actions and steps (pathways) Celso and Silvano followed to achieve their aspirations, what helped them to achieve them, which opportunities they took.

- Get the video ready on each electronic tablet to reproduce (including headphones). If necessary, create teams of two farmers and assign each pair 1 electronic tablet with the video ready to play and 2 headphones.

Part 3: Reflection on pathways

- After watching the video, identify the pathways that Celso and Silvano took to reach their current situation.

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20 We included these sentences in the facilitator’s guideline as a matter of politeness. But facilitators were not reached by the participants.
According to your perception, which are the pathways that Celso and Silvano and their families followed to get to where they are now? What did help them? Which opportunities did they take?

- Allow people to discuss briefly (maximum 5 min). Remember to tell them that there are no right or wrong answers. If necessary, help farmers to rephrase their ideas or ask questions.
- After the farmers shared examples, if necessary, supplement the pathways using ideas from the video.
- Help farmers to identify their own pathways to achieve the aspirations they defined in the last workshop.

This video shows the experience of two milk farmers and their families. Just as the aspirations of each person are different, the pathways that each one takes to achieve them are different.

- Help farmers identify their next actions and steps (after the first step they already did).

Now I would like you to identify their actions and steps (pathways) to achieve the aspirations that defined during the last workshop. What are the next actions and steps that you think you should take to achieve your aspirations? These actions and steps can be done - from now on and for the next two years.

- Guide farmers to define a logical sequence of actions and steps.
- Ask the farmers to draw or write their actions and steps on their diagram (inside the tunnel).

Draw or write within your diagram the actions and steps you have defined

- Help farmers identify opportunities that exist at home and within and outside of their community.

Now let’s reflect on what opportunities exist for you to carry out your actions and steps. Let’s first reflect on what opportunities exist within your household to achieve your aspirations. For example, savings, rental of machinery for extra income, etc…

Which opportunities exist within your community? For example, organization, cooperation and solidarity between members of the community.

Which opportunities exist outside your community, that is, opportunities offered by private or government institutions within your municipality, province, department or even at the national level? For example, programs, NGOs, municipality, banks, etc…

Over the top of the diagram, draw or write down the main opportunities.

- Help farmers identify potential difficulties they will face over the next two years as they seek to achieve their aspirations.

We have identified the existing opportunities. Now let’s identify some potential difficulties that you may face. This is for you to be aware and get prepared to overcome them.

What are the main difficulties that could arise as you seek to fulfill your aspirations, in the next two years?

Below in the diagram, draw or write down the main difficulties.

Part 4: Reflection on agency.

- Help farmers to reflect on difficulties in a positive way.

Difficulties will always be present, but they can be overcome. As Silvano said: Many times they say that field work is difficult. Well, obviously it is difficult… But I would tell other farmers not to be discouraged.

Both Celso and Silvano have faced difficulties and have managed to overcome them. As mentioned in the video, they attribute their success to their own effort, their families’ effort, their hard work, getting up early, not giving up. In short, they consider themselves responsible for their own success.

If they have been able to overcome difficulties and achieve their aspirations, you are able too. You must believe that you can do what you said you would do, despite any obstacles. Trust yourself, your hard work, your family’s effort, your experience and skills.

- Guide farmers to recall past experiences when they were successful. Remind them that success is personal, that it is not big or small achievements, and that they are all valuable.

We invite you to remember an experience in your life when you were successful. No matter which situation or what made you feel successful, that is something very personal and the standards of success are different for each person. The important thing is that this experience represents success for you and therefore it is valuable. If you wish, you can share it with the group. Now let’s reflect on what it was that help you to be successful. What do you attribute the success to? What did you do to be successful? Did you do something different that you had not done before?

- Give them a moment to reflect on these questions and emphasize that they are the main responsible for their success and that if they have achieved something before, they can also achieve anything now and in the future.

There may be many factors that contributed to your success, no doubt, you are the main responsible and so your effort and determination. Remember, you are the only one who can change your future. If you have been successful in the past, there is no doubt that you can do it again.

- Guide them to reflect on the emotions they felt during the successful situation.

Now, let’s reflect on how you felt when you were successful. How would you describe those feelings? Happiness, satisfaction, empowerment, fulfillment, self-confidence, etc…? For example, Don Celso said in the video: I feel happy.

- Guide them to imagine how they will feel during the next two years when they achieve their aspirations.

Now imagine how you will feel when you achieve the aspirations you have set for yourself. You will surely experience those positive feelings: happiness, satisfaction, fulfillment, etc.

Every time you face a difficulty or a problem, remember that you have overcome it before and that you have been successful.
Imagine how you will feel once you achieve your aspirations and find motivation in it to keep going.

Remember that you are responsible for your future, your success and your achievements

- Ask farmers to draw/write their past achievements around the circle where they represented their current situation.
- Task for the next workshop.

Your only task for the next two weeks is to reflect on what we have talked today, especially on the actions and steps you are going to take, how you can take advantage of the opportunities and reaffirm yourself that you can achieve what you have set out to do.

- Briefly explain what will be done in the third workshop.

During the next workshop, we will take the time to share with you more detailed information about the opportunities we have discussed and how some of the difficulties you mentioned can be overcome.

- Keep the diagram.

Workshop 3: Summary and best practices discussion

Workshop objectives

- Summarize the content of workshop 1 and 2.
- Provide information to support dairy farmers in realizing their aspirations.

Introduction

- Greeting and presentation

Hello, my name is ___. In today's workshop we will carry out three activities: (1) we will summarize the work that you have done in the two workshops, (2) you will see the video again to identify the best practices that Silvano and Celso carry out on milk production, and (3) we will have a talk in which we will share information about milk production.

Part 1: Summary of workshop 1 and 2
Approximate time: 15 min

- Form groups of 3 to 5 farmers to start the group activity.
- Give each farmer their diagram. Give a moment for the farmer to look at it and remember what they have drawn/written.

We will start by remembering what you have done in the two previous workshops. Take a moment to see what you have drawn or written on your diagram.

- Summarize on the content of the two previous workshops: aspirations, pathways and agency.

Aspirations: In the first session, you defined your aspirations on milk production, that is, what you want to achieve in the next two years.

Current situation: In addition, you made a diagnosis of your current situation with regard to milk production, that is, you identified where you are and what you have now.

Pathways: In the second session, you defined the actions and steps you will take to achieve your aspirations.

Opportunities: In this session you also identified your opportunities within your household, within and outside your community. Opportunities are positive or favorable situations that can help you achieve your aspirations.

Difficulties: In addition, you identified the difficulties that you may possibly face alongside the pathway to achieve your aspirations. Difficulties are unfavorable problems or situations that can complicate your pathway. In other words, they are stones on the road.

Agency: Although difficulties complicate our pathway, they are not a reason to be discouraged or give up. You shared with us that you have managed to overcome difficulties before, even similar to the ones you are likely to face in the next two years. You have also shared with me moments of success in which they have felt happy, fulfilled and satisfied. Once again, I invite you to keep these moments in mind and stay motivated, especially in difficult moments. If you have been successful in the past, there is no doubt that you can do it again.

Remember that there may be many factors that contributed to your success, no doubt, you are the main responsible and so your effort and determination. Remember, you are the only one who can change your future. If you have been successful in the past, there is no doubt that you can do it again.

Part 2: Video
Approximate time: 15 min.

- Ask the farmers to watch the video to identify best practices on milk production by Silvano and Celso.

We will watch the video again and this time I will ask you to identify the following:

- Which practices have Silvano and Celso improved their milk production with the technical assistance they received?
- Which practices do you carry out about food and nutrition, health, reproduction, hygiene, milk transformation (five pillars of milk production)?
- Get the video ready on each electronic tablet for playback (including headphones). If necessary, create teams of two farmers and assign each pair 1 electronic tablet with the video ready to play and 2 headphones.

Part 3: Best practices discussion
Approximate time: 30 min.

- Keep the same groups (from 3 to 5 people).
- Encourage the discussion on the 5 pillars of milk production with a participatory approach, that is, encourage farmers to share their own experiences, knowledge and information.

Part 4: Survey
Approximate time per person: 10 min.

- Carry out the survey to people who have participated in previous workshops. That is, if a farmer has only attended workshop 3, the survey is not carried out.
- Give farmers their diagrams and ask them to hang them in a visible place, such that they see it frequently and remember their aspirations, pathways and agency. Thank them for their cooperation and participation.
References


Bhan, P.C. (2020) ’Do role models increase student hope and effort? Evidence from India’ University of Glasgow (job market paper).


