<table>
<tr><td colspan="3">1. Outline of the Project</td></tr>
<tr><td colspan="2">Country name: The People's Republic of China</td><td>Project name: The Dairy Farming and Industry Development Center Project in Heilongjiang Province</td></tr>
<tr><td colspan="2">Fields: Agricultural/Rural development- Agricultural Development (Livestock Industry)</td><td>Assistance type: Technical cooperation project</td></tr>
<tr><td colspan="2">Supervising office: Paddy Field Based Farming Area Team Ⅲ、Group Ⅰ, Rural Development Department</td><td>Monetary amount of cooperation (at time of evaluation): Total of 283 million yen (as of January 2006; excludes personnel costs)</td></tr>
<tr><td rowspan="2">Period of cooperation</td><td rowspan="2">R/D: July 1, 2001, to June 30, 2006</td><td>Counterpart organizations: Science and Technology Agency of Heilongjiang Province, Livestock Breeding Bureau of Heilongjiang Province, Livestock Breeding Institute of Heilongjiang Province, Anda City Livestock Breeding Bureau, Xianyuan Town Government Livestock Breeding Center, National Dairy manufacturing and Technical Research Center—Longdan Milk Industry CO.,LTD.</td></tr>
<tr><td>Cooperating organizations in Japan: Ministry of Agriculture, Forestry and Fisheries</td></tr>
<tr><td colspan="3">Other associated cooperation: National Livestock Breeding Center; Snow Brand Milk Products Co., Ltd.; Nippon Milk Community Co., Ltd.</td></tr>
<tr><td colspan="3">1-1 Background and outline of the Project
Heilongjiang Province is located in an extremely cold region that has a long winter season. It also has vast grasslands and unused feed resources. Consequently, compared to agriculture, dairy farming has long flourished as a means of obtaining income throughout the year. In fact, Heilongjiang Province ranks number two in China in terms of milk and milk-products production. The government of Heilongjiang Province has taken various promotion measures that emphasize development of dairy farming and a dairy industry that can take advantage of the region's characteristics. However, such measures face problems that include poor pasture plant quality, low pasture plant production, low per-cow milk production, and delays in feed development.</td></tr>
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In order to improve this situation, the Chinese government submitted a request for project-type technical cooperation to the Japanese government in 1996. This cooperation would involve research and development on new technologies connected with dairy farming and manufacturing of dairy products.

1-2 Description of cooperation

Cooperation is being implemented at separate sites for dairy farming and dairy industry. A Project implementation and management office has been established within the National Dairy Engineering and Technical Research Center in Harbin to coordinate concerned organizations. The Science and Technology Agency of Heilongjiang Province serves as the supervising agency and the Livestock Breeding Bureau of Heilongjiang Province is the implementing agency. The dairy farming site is located at the Youyi Pasture in the Xianyuan town of Anda city, which is 150 km west of Harbin. Under the guidance of experts, pasture employees and personnel from the Anda City Livestock Breeding Bureau and Xianyuan Town Government Livestock Breeding Center are demonstrating technologies connected with feed production and feeding management, and providing technical guidance to model farming households and monitor farming houses in the surrounding region. And in the field of embryo transfer and alfalfa grassland management, the Livestock Breeding Laboratory of Heilongjiang Province is providing technical collaboration and cooperation in Chichiharu, a city located 400 kilometers from Harbin. At the dairy industry site, experts are transferring manufacturing technologies connected with cheese and fermented milk to counterparts at Longdan Milk Industry Co.,LTD. which is a testing factory of the National Dairy Engineering and Technical Research Center.

(1) Ultimate Goal

The income of dairy farming households in Heilongjiang Province is improved through development of the dairy farming and dairy industry.

(2) Overall Goal

Models established by the Project are extended throughout all of Heilongjiang Province.

(3) Project Purpose

Dairy farming and dairy industry models that are appropriate for Heilongjiang Province are diffused in the target region.

(4) Outputs of the project

Output 1: Dairy farming households in the target region can produce high-quality feed.

Output 2: Dairy farming households in the target region can appropriately feed and manage their dairy cows; the quality of their raw milk is improved.

Output 3: Dairy products are improved in terms of quality and are diversified.

(5) Inputs (at time of evaluation)

Japanese side

Dispatch of long-term experts:	Total of 13 experts
Dispatch of short-term experts:	Total of 29 experts
Provision of machinery and equipment:	222.57 million yen (including consumption tax, transport tax, insurance premiums, etc.)
Assumption of local costs:	60.41 million yen
Training of C/Ps in Japan:	34 C/Ps

Chinese side

Allocation of C/Ps:	60 C/Ps
Assumption of local costs:	26.63 million yuan (approx. 393.71 million yen)
Provision of land and facilities	

2. Outline of the Evaluation Team

Members	Team leader:	Kunihiro Doi	Executive Technical Advisor, Rural Development Department, JICA
	Dairy farming promotion:	Tsugio Koseki	Assistant director, Niikappu Station, National Livestock Breeding Center
	Dairy products:	Kazunori Yamagishi	Manager, Production Department, Yukijirushi Kodomo-no-Kuni Bokujo
	Evaluation analysis:	Toshiko Shimada	IC Net Limited
	Cooperation planning:	Kumiko Murata	Staff member, Paddy Field Based Farming Area Tam Ⅲ Group Ⅰ, Rural Development Department, JICA
	Interpreter:	Wu Zefeng	Manager of Japan region, Heilongjiang Overseas Tourist Co.,LTD. China

Evaluation period	January 5, 2006, to January 20, 2006	Evaluation type: Final evaluation

3. Outline of Evaluation Results

3-1 Confirmation of achievements

(1) Inputs

Planned inputs were implemented by both the Japanese side and Chinese side roughly according to schedule.

(2) Outputs

In all cases output indicators have achieved or are highly expected to achieve the target values.

1) Output 1: Dairy farming households in the target region can produce high-quality feed.

The yield of soiling corn harvested by monitor farming families for silage, which is the first indicator, was 2,500 kg/mu prior to the Project's commencement, although there were indications of an increase due to diffusion of technologies (application of organic fertilizer, urea fertilizer, etc.). In 2005, the harvest grew to 3,850 kg/mu. Although this was slightly less than the indicator value of 4,000 kg/mu, if farming households' improving technical levels and growing awareness of high-quality roughage production are considered, and if the yield is viewed based on average-year yield by eliminating the weather effects, it can be said that the harvest roughly achieved the target value. Per-unit yield of hay at Youyi Pasture, which is the second indicator, increased from 220 kg/mu to 306 kg/mu due to grassland improvements, thereby achieving the indicator of 300 kg.

2) Output 2: Dairy farming households in the target region can appropriately feed and manage their dairy cows; the quality of their raw milk is improved.

The average amount of per-dairy cow milk produced by the monitor farming families increased from 5,300 kg to 5,812 kg during the Project Period due to improvements in supply of feed, such as supply of corn silage. This reached the initial indicator of 5,800 kg. Milk quality also showed continuous improvement in response to advances in diffusion of technologies to monitor households. The total bacterial count improved from 2 million/ml to 300,000 ml, and the whole milk solids rate improved from 11.6% to 12.2%. Both improvements exceeded their target values.

3) Output 3: Dairy products are improved in terms of quality and are diversified.

As a result of C/Ps acquiring technologies for stabilizing yogurt quality, yogurt acidity has been stabilizing from 6.80 in 2003 to 4.47 in 2005; thus, it can be said that quality is improving. Beginning from a base of zero, cheese manufacturing technology at the dairy industry site has improved to the point that the site can now manufacture 12 kinds of natural cheese and 25 kinds of processed cheese. Of these, three kinds of aged natural cheese, five kinds of unaged natural cheese, and eight kinds of processed cheese made by adding fruits and spices that are special products of China are candidates for product commercialization. In all three areas, these figures exceed the target values. In the area of fermented milk, sampling is under way on 10 types that are produced through application of probiotic technology and by using different stabilizers and stabilizer compounding ratios. Thus, the goal of producing one sample for product commercialization has been achieved.

(3) Project Purpose: Dairy farming and dairy industry models that are appropriate for Heilongjiang Province are diffused in the target region.
If the amount of high-quality milk produced in the target region (Youyi Village and Hongxing Village, Xianyuan Town, Anda City), which is an indicator of the Project Purpose, is projected using its rate of growth thus far, it is expected that production will exceed the target value of 11,000 tons by the end of the Project. The manual for normalizing the model that will be necessary for future extension of the technologies has been prepared in trial version, with the completed manual expected to be finished during the remaining Project Period. Thus, it is judged that the Project Purpose has been largely achieved.

3-2 Outline of evaluation results
(1) Relevance
In recent years, demand for milk and dairy products has been increasing in China in line with a rising standard of living among the Chinese public. As a result, Heilongjiang Province is seen as an important production base, as it is ranked number two in China in terms of milk and dairy product production. The technologies that are being transferred through the Project directly contribute to the promotion of dairy farming and dairy industry as pursued by the province through its dairy farming and dairy industry development program (2002 to 2005). Moreover, the Project is judged to provide appropriate and necessary cooperation as a means of resolving problems faced by the province in the dairy farming and dairy industry field. Furthermore, both the Ministry of Foreign Affairs' "Economic Cooperation Program for China" (formulated in

2001) and JICA's country program for China (formulated in 2002) emphasize "cooperation to agriculture and rural development in inland regions with poor natural conditions," and the Project has high conformity with these aid policies of Japan. Accordingly, the implementation of cooperation has extremely high relevance.

(2) Effectiveness

Through the Youyi Pasture and demonstrations by model households, small-scale dairy farmers that previously had no interest in introducing new technologies have been gradually confirming the effectiveness of technologies transferred by the Project (milking sanitation technologies, soil improvement technologies, etc.) and actively implementing them. This is thought to be tied to growing production of high-quality raw milk that is mentioned in the Project Purpose. On the other hand, the definition of the "model" to be pursued by the Project is ambiguous, and indicators to reflect Output 3 for dairy industry are not established. During the final evaluation, these areas were studied, the model was examined in terms of the entirety of dairy farming/ dairy industry technologies, and preparation of a manual as an indicator of whether a model with a view to future extension has actually been established was added. Currently, a trial edition of the manual, which covers dairy farming/dairy industry as a compilation of the three Outcomes comprising the Project Purpose, has been prepared, and it is expected that the completed manual will be finished during the remaining Project Period. Thus, it is determined that the Project Purpose will be achieved. Therefore, despite the fact that there are problems in the clarity of the Project Purpose's content and the establishment of indicators, the Project is deemed to have high effectiveness, as effects as originally envisioned are being realized.

(3) Efficiency

Necessary inputs (dispatch of experts, allocation of C/Ps, assumption of local costs, C/P training in Japan, etc.) were in general implemented without problems and according to schedule. Factors contributing to the smooth implementation of broad-ranging activities included 1) the four interpreters hired at Chinese expense promoted smooth communication among concerned personnel, 2) much of the training in Japan could be applied directly to Project activities, and 3) C/Ps meetings and the monitoring committee functioned as a means for confirming activity progress and sharing information. In addition, cropping of corn silage increased and production grew as a result of, respectively, the fact that barn feeding of animals increased as a result of an ordinance prohibiting open grazing and that dairy-product companies began applying

stricter quality management of basic materials. Thus, these developments may be seen as external factors that were linked to improved raw milk quality. Conversely, however, a number of factors can be seen as lowering the efficiency of technical transfer and limiting technical exchange and collaboration in both fields. These include 1) delays in installation of some provided machinery and equipment and low rates of operation, 2) a tendency for work to require the guidance of experts, as many C/Ps were extremely busy both working in the Project and executing their own responsibilities, and 3) the Project design, in which both counterpart organizations and cooperation content covered a broad range given that the dairy farming and dairy industry sites were separated.

(4) Impact

At the present time, there are no Project effects that are particularly noteworthy compared to the size of the inputs, as, in both dairy farming and dairy industry, almost no effects extend far beyond the target regions and target groups. However, the Project implementation management office is aware of the importance of extending the Project and has a strategic blueprint toward this end. Moreover, Anda City has shown its intention to standardize technologies that were transferred through the Project and to raise the technical capabilities of all dairy farming families. Consequently, if itinerant extension activities are steadily conducted in the six regions and a detailed strategy for the extension program is planned and implemented over the remaining cooperation period, it is expected that the Overall Goal can be achieved in three to five years after the Project's completion. Thus, the Project's impact can be rated somewhat highly. Unanticipated secondary effects that are other than the Overall Goal include the following: 1) C/Ps set up a dairy cow association made up of small-scale dairy farming households in Youyi Village, using an agricultural cooperative they studied during their training in Japan as a reference. Similar movements are currently spreading to other regions. 2) The town government built a dairy farming housing complex near the dairy farming site that is helping the Project diffuse technologies to dairy farming families in ways that were originally unanticipated. 3) At the dairy industry site, success was achieved in separating lactic acid from pickles that could be a new strain. 4) Moves toward production of cheese products are accelerating at Longdan Milk Industry Co.,LTD. which previously engaged in very little cheese manufacturing.

(5) Sustainability

For both the dairy farming and dairy industry fields, Project sustainability can be rated highly in terms of political and technical aspects. In terms of organizational aspects, dairy farming is expected to have high sustainability due to existing extension systems and organization. And, looking at dairy industry, there is high potential for independent growth as development of dairy products that suit consumer preferences and management efficiency progress based on privatization-led competition principles. However, procedures for widely and generally sharing transferred technologies that reach beyond one private company must be clarified in the extension program strategy. Looking at financial sustainability, there are problems in both dairy farming (support for small-scale dairy farming households and autonomous management of Youyi Pasture) and dairy industry (securing budgetary funding that is difficult to tie to company profits, such as that needed for technology extension workshops, etc.). Therefore, further financial support from the provincial government will be essential in implementing the extension program.

3-3 Factors contributing to emergence of effects

(1) Factors pertaining to planning content

In the dairy farming field, Anda, a city in which dairy farming is so prevalent that it is recognized as the "home of the dairy cow," was selected as the target region for the Project, and demonstrations were incorporated into the Project's plan. At the same time, external factors emerged that included changes in type of animal feeding resulting on prohibition of open grazing and stricter business standards for dairy-product companies. All of these factors contributed to a growing desire among dairy farming households to improve milk production and quality and, further, to stabilized supply of high-quality feed and increased raw-milk production. In the dairy industry field, given the almost complete lack of cheese manufacturing technology and lactic-acid identification/separation technology as well as fierce competition throughout the industry, recognition by the Chinese side that the Project's technologies were vital to development of its dairy industry contributed to manifestation of effects.

(2) Factors pertaining to the implementation process

The fact that, from the second half of the Project Period, the Project implementation management office (Livestock Breeding Bureau of Heilongjiang Province) took a leading role as the agency responsible for coordinating concerned organizations contributed to the manifestation of effects. Likewise, the monitoring committee functioned to promote smooth communication among Project personnel that were working separately

at the dairy farming and dairy industry sites, to ascertain activity progress and next-phase plans, and to share information and experience. In addition, monthly C/P meetings at each site served to promote sharing of information on the progress of individual activities and problems.

3-4 Problem areas and factors leading to problems

(1) Factors pertaining to plan content

Because the dairy farming and dairy industry sites were separate and, in the area of dairy farming, the model pasture and the Livestock Breeding Laboratory of Heilongjiang Province were distant from each other, cooperation from the production of basic milk to production of manufactured products was not integrated. Moreover, because cooperation at each site covered a broad range, overall collaboration between the dairy farming and dairy industry fields was weak and synergetic effects during Project implementation were limited. Furthermore, definition of "model" in the Project Purpose was ambiguous from the planning stage and indicators were not set to correspond with the Outputs. Therefore, although the Outputs and Project Purpose were roughly achieved in terms of the indicators, these problems are thought to have contributed to somewhat low efficiency and manifestation of effects.

(2) Factors pertaining to the implementation process

Because, in both the dairy farming and dairy industry fields, the C/Ps were extremely busy due to their having to handle both Project duties and their own responsibilities, implementation of activities required expert guidance, and this impacted on the efficiency of technical transfer. Moreover, although the Project deserves high praise for its active application of the PO (Plan of Operations), from the standpoint of the Project implementers, insufficient study was given to the definition of "model" in the Project Purpose and to the preciseness of the indicators. Thus, at the present time, ripple effects from the Project are limited in light of the size of the inputs.

3-5 Conclusion

In general, implementation of the Project's activity plan is proceeding favorably. The three outputs and the Project Purpose have already been achieved or are expected to be achieved during the cooperation period. Furthermore, although a number of issues remain with regard to financial and organizational sustainability, Chinese personnel are fully aware of the importance of extending the technologies that were introduced through the Project from the standpoint of dairy farming/industry promotion, and it is

expected that specific activities toward extending these technologies in six regions of Heilongjiang Province will begin during the remaining cooperation period. Given these circumstances, the Project will be concluded according to plan on June 30, 2006.

3-6 Recommendations

The team proposes to the Joint Coordination Committee that the PDM that was modified for evaluations and utilized in this final evaluation be used as a revised PDM (Version 5). It will be important that remaining activities be steadily implemented during the Project Period based on this PDM, and that efforts be made to achieve the Overall Goal and the Ultimate Goal following the end of the Project.

(1) Short-term recommendations (up to the end of the cooperation period)

- Final versions of technical manuals for dairy farming and dairy industry should be prepared, and itinerant technical guidance and extension activities that target a broad range of concerned personnel should be actively implemented.
- A detailed strategy for the extension program should be drawn up under the guidance of the Project implementation management office. In drawing up this strategy, focus should be placed on those technical fields requiring extension that are identified based on the results of the abovementioned itinerant technical guidance, and care should be given to clarification of roles among each concerned organization, specific budgetary measures, utilization of trained technicians, monitoring methods, etc.

(2) Long-term recommendations (after the end of the cooperation period)

- Extension of dairy-farming and dairy-industry technologies that were introduced through the Project should be steadily implemented in Heilongjiang Province in accordance with the extension program and its detailed strategy. Regular monitoring of progress should be conducted under the direction of the Science and Technology Agency of Heilongjiang Province and the Livestock Breeding Bureau of Heilongjiang Province, and revisions of the extension program should be made as appropriate.
- In order to further develop the dairy farming and diary industry fields, the results of technical extension to diary-farming and dairy-industry personnel should be announced in not only Heilongjiang Province but throughout China, and active technical exchange with Japanese personnel should be pursued.

3-7 Lessons learned

- For projects having C/Ps from multiple organizations, it is essential to establish an organization that will take a leading role as an office for practical coordination of the project so as to ensure effective operation and management. Like the Project implementation management office for this Project, this office will be different in format from the coordination committee.
- Application of the PO and holding of regular meetings, such as counterpart meetings, are important from the standpoints of not only project operation and management but also achievement of outputs. This is because they are useful in helping project personnel ascertain activity progress and in fostering an awareness of problem areas.
- The PDM is a cooperation plan that is established through logical analyses and meetings of concerned personnel prior to the project's commencement. However, because the environment surrounding the project is constantly changing, there is the possibility that external conditions that were unanticipated beforehand will have an impact. Consequently, project implementers should actively utilize the PDM as a means for project operation and management while also making revisions based on agreements among concerned personnel as necessary.