

Planning for Expansion and Growth of Our Dairy Enterprise to Compete in the 21st Century

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Introduction

The purpose of this paper is to explain why the Doornink family of Baldwin, WI, who own a nationally recognized registered Holstein herd of 90 cows averaging 25,000m 900f 780p with a BAA of 106, decided to borrow about \$1,000,000 to build a modern, highly efficient 300 cow free stall barn, milking parlor, and feed storage center.

Description of Jon-De Farm, Inc.

Jon-De Farm, Inc. is a family corporation owned by Jim, Dean and Margaret Doornink located next to Baldwin, Wisconsin, a rapidly growing village 40 miles east of St. Paul. Before this expansion, the major enterprise of Jon-De was a 90 cow registered Holstein milking herd housed in a conventional comfort stall barn. The rolling herd average at Jon-De was 24,729m, 897f, 780p which made it one of the top 50 herds for production in Wisconsin. The BAA for this herd was 106.1 which made it one of the better typed homebred herds in the USA. The high production and excellent type qualified this herd to receive the coveted PBR award from the Holstein Association for 35 years. There are only two active herds in the USA which have received this award more often than Jon-De.

Jon-De also consisted of 725 acres located in Hammond and Rush River townships of St. Croix County. This land was used to grow 385 acres of alfalfa and 145 acres of corn. In addition 21 acres of crop land was cash rented and 150 acres of crop land was share rented for the purpose of growing corn and alfalfa. The machinery owned by Jon-De and utilized to husband these crops was quite modern and capable of harvesting the crops in a timely manner. Innovative cropping and harvesting techniques were utilized to obtain an adequate supply of high quality feed.

The management and labor team for Jon-De Farm consisted of Jim Doornink who was responsible for agronomy Activities, Dean Doornink who was the Financial and Employee Manager, Todd Doornink who was the Herdsman, 2 retired farmers who worked part time and 1-2 trainees from foreign countries. In addition,

Jim Linn, Extension Dairyman-University of Minnesota was employed as a nutrition consultant, Ed Hubbell, operating manager of Animal Analysis Association, was employed as a cattle mating consultant, Randy Welch of Welch Crop Consulting was employed as a crop consultant and Bill Ziegler of Ziegler Farm Management was employed as a financial consultant.

Financial History

From 1940 to 1980 cash income from milk sales was augmented by the sale of breeding stock. Via the sale of breeding age bulls to commercial dairymen and via the sale of springing heifers and young cows to beginning dairymen, total cattle sales of \$50,000/yr were common. The sale of breeding age bulls began to dwindle as artificial insemination was adopted by commercial dairymen. Jon-De stopped selling breeding age bulls in 1974 when their price dropped below the cost of raising them. With the advent of the farm crisis in the 1980's, sales of springing heifers and young cows dwindled since there were very few beginning dairymen and they were not willing to pay much more than the heifer raising cost. Cattle sales that commonly totaled \$50,000/yr were now negligible. In 1985 Jon-De Farm had a net operating loss for the first time in recent history. In spite of several attempts at diversifying and reducing expenses, the net operating losses continued.

In 1989 Jon-De Farm was part of a pilot project initiated by the University of Wisconsin Center for Dairy Profitability. This pilot project resulted in a financial comparison of Jon-De Farm with 36 other Wisconsin dairy farms. The results of this comparison are shown in Table 1 and indicate the following points about Jon-De Farm.

1. Milk sold per cow is in the highest quartile
2. Hay yield per acre and corn silage yield per acre are in the third and fourth quartile.
3. Dollars of purchased feed per dollar of milk sales as well as feed cost/cwt milk sold are in the second lowest quartile.
4. The Debt to Asset Ratio, Capital Rate of Return, and Capital Turnover are about average.

Paper presented at the Fall Conference for Veterinarians, College of Veterinary Medicine, University of Minnesota, October 22, 1992, Dr. James Hanson, Coordinator.

While the above points indicate that Jon-De Farm is a very productive and well managed dairy farm, there are some points of concern. These are:

1. Cows per worker and milk sold per worker are in the lowest quartile.
2. Farm Capital per Cow, Machinery and Equipment per Cow, Real Estate per Cow, and Farm Debt per Cow are all in the highest quartile.

The shareholders and directors of Jon-De Farm held a corporate meeting to discuss the results of this comparison. After reviewing the results, the following points were agreed upon.

1. The management and workers of Jon-De Farm are capable of getting dairy cattle to produce at their genetic capacity.
2. The directors desired that Jon-De Farm remain in the dairy business.
3. Because of the name recognition obtained by receiving the PBR Award for so many years, Jon-De should maintain the present registered Holstein Herd in a form that it would continue to receive the PBR Award.
4. Some steps needed to be taken soon to return Jon-De to a profitable status.

Deciding How to React

The directors decided to expand the herd to a size that would meet our financial obligations and provide an adequate living for the shareholders and workers. Although the present facilities were excellent at exhibiting cattle for merchandising purposes, adding facilities of similar design would be expensive to build, costly to maintain and labor intensive.

The addition of a free stall barn and a milking parlor to the present comfort stall was considered. However, the proposed expanded facilities were still labor intensive, had poor cow flow, required extensive mechanical ventilation, and due to their proximity to the village of Baldwin, a limited useful life. After consulting with Brian Holmes, Extension Ag Engineer, UW-Madison, it was decided to investigate the feasibility of building new facilities on land already owned by Jon-De Farm and located 4 miles south of Baldwin. The site selected for construction had many attributes:

1. Access from a well maintained but little used township road.
2. Land contour that provided natural drainage and minimized earth moving requirements.
3. No wind obstructions from south for good summer ventilation and a wind break to the northwest.
4. Adequate supply of gravel on site for constructing roads and building bases.

5. Adequate supply of clay on site for sealing lagoons.
6. Close proximity of 3-phase electricity.
7. 425 owned acres within 1 mile for easy manure disposal.

By not being tied to fitting the expansion into existing facilities, many new opportunities were available. It was now possible to look for facility designs that met all of our criteria. These criteria are:

1. Cattle must be clean.
2. Cattle must be comfortable.
3. Design must be simple to maintain.
4. Design must allow for future expansion.
5. Design must minimize labor requirements.

With these criteria in mind, my brother Jim and I attended a dairy herd management conference that was organized by the University of Minnesota Extension Service. This conference convinced us that it would be possible to design a free stall facility that met all of our criteria. It was also helpful in sizing the parlor, designing the feed storage center, warning of the herd health problems that would be encountered and preparing the business proposal that would be presented to the creditors when seeking financing.

To gather ideas for our facility, Jim or I toured 30-40 free stall facilities in Wisconsin, Minnesota, Arizona and California. At each dairy ideas that should be incorporated into our design and also design errors that should be prevented were observed. We were most impressed with Rosenholm Dairy at Waumandee, Wisconsin. In addition, to meeting the 5 criteria listed above, it had good cow flow, comfortable milking conditions, low building cost/cow, and its manure storage and disposal plan protected the environment. Other dairies contributed ideas on parlor cow flow, parlor ventilating, cow watering systems, and catch lanes for sorting cattle. We are grateful to each dairyman that took time to give us a tour of their facilities. These tours prevented many design mistakes and was time well spent.

It was decided that the dairy complex would consist of:

1. A cold free stall barn with curtain side walls, center aisle for drive through feeding, 4 pens limited to 80 stalls per pen, flush system utilizing recycled water for manure removal, and cross aisle for moving cows to milking center.
2. A holding area with 100 cow capacity, flush cleaning, gentle crowd gate, double return lanes with automatic sorting.
3. A walk in, double 10, rapid exit, herringbone parlor with automatic cow identification and daily milk weights.
4. A gravity flow 3 stage lagoon system for storing

manure and cleaning flush water.

5. A feed storage complex consisting of 3 bunker silos and 5 bay commodity storage shed.

Initially 4 construction companies were asked to prepare bids for the dairy complex that was proposed. Only Durand Builders of Durand, Wisconsin was willing to prepare detailed plans and cost estimates which incorporated our ideas. They had many good suggestions and hired a consultant to design the manure flush system. They did this with no guarantee that the complex would be built or that they would be the contractor.

Deciding if This Action is Feasible

The construction cost estimates from Durand Builders, along with production costs from Jon-De's present herd, and educated estimates of other input costs were used for a computer study to determine if it was economically feasible to build a new dairy complex with today's reduced milk prices. This study was set up on a computer spread sheet so that the influence on cash flow of altering any input data could be easily determined. A typical case study is shown in Table 2. The influence on cash flow of interest rate, cow numbers, milk price, feed cost, cow replacement cost, and percent rented out as recipients was studied extensively. The following points became obvious:

1. The minimum size herd that would generate sufficient income to pay expenses and service the debt load was 250 cows in milk. Increasing cows in milk to 300 and housing the dry cows elsewhere made debt service much easier.
2. The barn must be filled to capacity as soon as possible after construction was completed. Therefore it was decided to purchase most of the initial cattle and use surplus cattle from the present herd as replacements.
3. For the first few years cash flow was enhanced by renting out as surrogate dams as many cows as possible. In later years, when their producing ability became known, the good cows should carry their own calf and the surrogate dam rental program should be phased out.
4. Purchasing the computer system for recording daily milk weights resulted in improved cash flow since DHIA testing was no longer necessary. An added bonus was automatic identification and automatic sorting of cows which assisted the herdsman in managing the herd.

A summary of income and expenses expected during the first 5 years of this new enterprise is presented in Table 3. These projections indicated that it would take 4 years to become profitable but the cash flow was

positive the first year and increased dramatically during the next 4 years. At the end of 5 years, \$384,000 of the loan would be repaid and principal payments in excess of \$110,000 could be made yearly. The milk price used in this study was a conservative \$10.50/cwt which is guaranteed for the next 5 years by the present farm bill.

Effect of Adding This Dairy to Jon-De Farm

As shown in Table 4, the effect of adding this proposed dairy to the other Jon-De enterprises caused some significant changes in the financial comparison with the 36 other Wisconsin dairy farms. Adding this free stall dairy to Jon-De Farm increased the number of cows per worker and milk sold per worker into a range that is very labor efficient. The farm capital/cow, machinery & equipment/cow, and real estate/cow are well below the Wisconsin average. The farm debt/cow and debt to asset ratio still exceed the Wisconsin average but, with the ability to pay yearly in excess of \$110,000 of principal payments, these ratios will be in the acceptable range within 5 years.

Of the total feed used for this dairy, \$116,100 of hay, haylage and corn silage are purchased from the Jon-De Agronomy enterprise. Feeding the 90 cow Jon-De herd and this 305 cow herd requires 350 acres of alfalfa, 150 acres of other hay, 100 acres of oatlage, 120 acres of corn silage, and 550 acres of corn for high moisture ear corn (HMEC). A normal crop acreage is 385 acres of alfalfa, 120 acres of oatlage, 30 acres of other hay, and 250 acres of corn. Jon-De would not be able to grow all the corn needed as HMEC but St. Croix county is a corn exporting area and shelled corn is readily available at a competitive price.

Securing Financing

Much of the information in this paper was also included in a 25 page proposal that was presented to 4 lending agencies. The following information was included in the proposal:

1. Description of present operation.
2. List of management and labor team with education, authority, responsibility and work duties delineated for each team member.
3. Financial analysis of present operation with complete listing of assets and liabilities and a financial comparison with 36 other Wisconsin dairy farms.
4. Description of proposed facility with estimated cost for each component.
5. An analysis of proposed investment which included a 5 year expected income and expense summary and a comparison of expected financial position with 36 other Wisconsin dairy farms.

The proposal and request to borrow was presented in February 1991 to Farm Credit Service, two local banks, and a regional bank from eastern Wisconsin. The regional bank lost interest when it became clear that the proposed dairy might have negative cash flow the first year without some principal payment delays. Since the loan request exceeded their lending limits, both local banks searched out regional banks to co-finance the proposed loan. The loan officer for one of the co-financing regional banks was unfamiliar with registered dairy cattle and his appraised values of existing and proposed facilities were very conservative. It was decided to discontinue seeking financing from them. The remaining local bank and their co-financing regional bank had difficulty locating a qualified appraiser and decided to wait for the certified appraisal being prepared by Farm Credit Service. When the appraisal finally was available, they did not have adequate time to evaluate the appraisal and the loan request was withdrawn.

Initially the loan officer for Farm Credit Service had reservations concerning the size of loan request. Only an on-farm-demonstration of the management at Jon-De Farm was able to convince him that this might be a worthy loan to finance. Within two weeks the loan officer had prepared his own feasibility study which confirmed that this project would cash flow. It took 6 weeks to prepare and furnish the loan officer with additional information not contained in the original loan proposal. Within two months after requesting financing, FCS had prepared a tentative loan package involving real estate loans from FLCA, operating loans from PCA and equipment leases from FC Leasing. However, formal approval was delayed until the certified appraisal was completed, a process that took 12 more weeks. The FCS employee assigned to appraise the land and facilities of Jon-De Farm as well as the proposed dairy complex was very thorough, very meticulous and very slow. The appraisers task of determining fair market value for the present dairy and 225 acres was made more difficult because of its proximity to the Baldwin village. The appraisers task of determining fair market value of proposed dairy complex was made more difficult because there were very few sales of such facilities.

In spite of very conservative appraised values for the land located next to Baldwin, the asset values were adequate and the FCS loan committee approved the loan request in August, 1991. It took 6 1/2 months to have the loan request approved. Closing with FLCA, PCA and Farm Credit Leasing occurred on August 29, 1991.

Construction Permits

Several permits were required to build this dairy.

1. A sanitary permit to dispose of human waste

from rest room located in dairy complex. Obtaining this permit from Wisconsin was uneventful but installation was expensive since only one location on the 10 acre site was acceptable for a mound type disposal field.

2. An animal waste storage permit issued by SCS district office. Securing this permit was the responsibility of Durand Builders and was made more difficult because the SCS district office with jurisdiction had limited experience with a 3 lagoon flush system. The local SCS office was responsible for supervising construction of the lagoons and was quite meticulous about thickness and compaction of clay liner.
3. A building permit issued by Rush River township was issued only after a special informational meeting for the township residents was held at which the directors of Jon-De Farm explained what, why and how they planned to build. Major concerns were manure storage and disposal, increased traffic causing deterioration of roads, influence on property taxes, and influence that this additional milk would have on milk prices.
4. A special use permit, issued by the St. Croix County Board of Adjustments, was required whenever a feedlot facility exceeds 250 animal units. The rationale for requiring this permit was that it allowed the Adjustment Board to insure that there was adequate land to dispose of manure without causing surface or groundwater contamination and that all buildings had adequate setback from road right-of-ways. However, several Rush River township board members interpreted the special use permit as an absolute ban on feedlots in excess of 250 animal units and filed a letter in opposition to granting the special use permit. The Adjustment Board traditionally sides with the township board. However, when a detailed plan explaining how the manure nutrients would be matched to crops that would utilize the nutrients, the Adjustment Board granted the special use permit with the stipulation that a progress report be given after one year and that Jon-De Farm test all water wells for nitrate concentration monthly within one mile of the dairy. The township board filed a letter of protest requesting an explanation of why the Adjustment Board had not supported their position. The water wells are being tested monthly. The manure nutrient concentration will be measured when it is applied to cropland

land this fall. The manure application rate will be adjusted to provide only those nutrients needed by the crop that will be grown. A very detailed report of manure application and water well test results will be presented to Adjustment Board in May 1993.

Construction

Durand Builders of Durand, Wisconsin was selected as general contractor with responsibility for all aspects of construction. They hired the sub-contractors and orchestrated all phases of construction except the milking equipment which was purchased from Ralph's Electric, a Boumatic dealer located in Baldwin. Construction started on September 10, 1991. In spite of 5 inches of rain on September 15, construction proceeded smoothly until October 30 when 14 inches of snow initiated winter. It was decided to finish constructing only what was necessary for milking and leave the rest for spring. Milking commenced on December 18, 1991. The construction delayed by the October 30th snow-storm was completed in May as well as an expanded apron in front of bunker silos. There were no cost overruns.

A Nine Month Review

After operating the dairy for nine months, there is nothing that should have been designed differently. The cows are clean, seem comfortable, and have consistently produced better than 60#/day. Steady state milking rate has increased to 88 cows/hour. Although initially purchased to save money on milk testing, the biggest benefit of the computer system is finding cows that need attention. The workforce, consisting of one part time milker, one full time milker, and one herdsman has developed

into a team that works well together and requires little supervision. There has been no turnover in the workforce.

The feasibility studies had assumed an interest rate of 10%, a milk price of \$11.06/cwt, and a springing heifer price of \$1300/head. During the first nine months the interest rate has been 7.25%, the milk price averaged \$13.72/cwt, and replacement springing heifers have averaged \$1100/head. The resulting improved cash flow was used to build feed inventory.

On August 5th the 80 stall dairy barn, which still housed the registered herd, was completely destroyed in a flash fire. Fortunately nobody was hurt, no cattle were lost, and the loss was covered by insurance. Although the loss was a tragedy, it was also an opportunity. An opportunity to house both herds at the highly efficient new dairy. An opportunity to cull more intensively. An opportunity to consolidate the workforce. Most of the registered cows have adapted well to the free stall barn and their production during the first DHIA test was 97% of the previous month. A bunker silo at the new dairy will replace 2 tower silos destroyed by the fire and a modified Virginia style youngstock shed that houses 120 head will be built at minimum cost on foundation of burned out barn. Built next to the parlor will be an inexpensive, naturally ventilated, and labor efficient 40 stall barn with eight maternity pens. The stalls will house older cows that no longer can compete in the free stall barn. The remaining insurance proceeds will pay down FCS loans.

Perhaps the greatest benefit of the fire is that it focused everyone's attention on making the new dairy profitable as fast as possible. The quality of cattle is much higher, the management capability of the consolidated workforce is enhanced tremendously and all members know that they are associated with an enterprise that has a very good chance of surviving the impending revolution facing the mid-west dairy industry.

TABLE 1. 1989 Wisconsin Dairy Farm Management Analysis - 36 Farms Quartile*

	1st	2nd	3rd	4th	JON-DE
SIZE OF BUSINESS					
Average number of cows	40.1	57.6	77.6	99.6	88.0
Average number of hfrs	33.0	51.6	78.1	111.2	104.0
\$ milk sold (000)	128.3	165.2	234.1	324.2	275.1
Worker equivalent	1.7	2.4	2.9	4.4	6.6
Total tillable acres	125.0	218.0	321.0	481.0	651
RATES OF PRODUCTION					
Pounds of milk/cow	16210	18298	19386	21894	23199
DM tons hay/acre	2.3	3.4	3.7	4.4	3.6
Tons corn silage/acre	9.0	14.2	16.2	22.1	20.2
LABOR EFFICIENCY					
Cows per worker	17.0	21.9	28.1	37.8	20.0
Pounds milk/worker (000)	320	400	534	722	310
COST CONTROL					
\$ purc feed/\$ milk sales	.207	.278	.304	.445	.250
Feed cost/cwt milk	\$2.83	\$3.79	\$4.56	\$5.87	\$3.93
Labor & mach cost/cow	\$422	\$742	\$888	\$1321	\$2673
Operating cost/cwt milk	\$6.31	\$7.65	\$8.43	\$10.31	\$8.73
CAPITAL EFFICIENCY					
Farm capital/cow	\$4829	\$6869	\$9005	\$11997	\$12722
Mach & equip/cow	\$ 735	\$1294	\$1680	\$2561	\$1953
Real estate/cow	\$1139	\$2895	\$4365	\$6230	\$5318
Capitol turnover, yrs	1.3	2.1	2.5	3.5	1.9
PROFITABILITY					
Net farm income	\$18366	\$41464	\$49297	\$88360	\$39596
Lbr&mngmnt/manager	-\$2739	\$14561	\$33705	\$56955	\$5987
ROR-equity capital	1.5%	8.8%	17.2%	46.9%	15.7%
ROR-all capital	3.4%	8.9%	12.9%	20.3%	11.2%
FINANCIAL SUMMARY					
Net farm worth (000)	\$127	\$269	\$434	\$810	\$1476
Debt to asset ratio	0.01	0.22	0.4	0.62	0.31
Farm debt/cow	\$435	\$1443	\$2788	\$5376	\$6605

* A quartile is defined as 25% of the total. In this case there are 36 farms. This means that there are 9 farms in each quartile. The number or value in a quartile is the average for those 9 farms. The rows are independent of each other. This means that the 9 largest herds averages 99.6 cows. However the 9 largest herds did not average 21894# milk. These could be herds of any size.

TABLE 2. Typical Feasibility Study

INVESTMENTS - BUILDINGS (20 yr life)

Parlor and equipment	\$261494
Barn and pits	\$359930
Barn steel	\$ 21000
Bunker silos	\$ 34000
Commodity shed	\$ 20000
Water well	\$ 8000

EQUIPMENT (10 yr life)

Mixer truck	\$ 35000
Loader	\$ 15000

CATTLE (5 yr life)

305 cows	\$396500
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TOTAL INVESTMENT

\$1151379

ASSUMPTIONS

Number of milk cows	256
Total number of cows	304
Production/cow	20000
Feed cost/cwt	\$4.00
Milk price/cwt	\$10.50
Cull Rate	25%
Cull cow price	\$500
Bull calf price	\$100
Heifer calf price	\$250
Replacements cost	\$1300
Vet cost/head	\$ 60

Interest rate	10%
Hourly wage rate	\$6.25
Herdsman	\$25000
Cows milked/hr	50
DHIA cost/head	\$00
Semen cost/preg	\$40
Recipient rent	\$300
% used for recipis	25%
Promotion cost/cwt	\$.15
CCC assessment/cwt	\$.11

INCOME

Milk sales	\$ 537600
Cull Cows	\$ 32000
Recipient rent	\$ 19200
Bull calves sold	\$ 9600
Heifer calves sold	\$ 24000

TOTAL INCOME

\$ 622400

VARIABLE EXPENSES

Feed	\$217940
Vet	\$ 15360
Semen	\$ 7680
DHIA	\$ 0
Promotion	\$ 7680
CCC assessment	\$ 5632
Interest	\$114079
Replacements	\$ 76000
Labor	\$ 48360
Building depreciation	\$ 35244
Cow depreciation	\$ 60000

FIXED EXPENSES

Supplies	\$ 5000
Bedding	\$ 6000
Consultants	\$ 1000
Milk hauling	\$ 2700
Utilities	\$15000
Repairs	\$ 5000
Taxes	\$ 7000
Insurance	\$ 5000
Manure remvl	\$10000
Equip. depreciation	\$ 5000

TOTAL EXPENSES

\$650476

TOTAL CASH EXPENSE

\$549432

FINANCIAL SUMMARY

Cash flow	\$ 72968
Profit	-\$28076
Yrs to pay off invstmnt	15.78

TABLE 3. Expected Income and Expenses

	Year 1	Year 2	Year 3	Year 4	Year 5
ASSUMPTIONS					
Cows in milk	261	304	304	304	304
Production/cow	18000	20000	21000	22000	22500
Cull rate	20%	25%	30%	33%	33%
Herdsman salary	24000	25000	26000	27000	28000
Hourly rate	6.00	6.25	6.50	6.75	7.00
INCOME(000)					
Milk sales	416	538	565	591	605
Total income	479	622	656	686	695
EXPENSES(000)					
Interest paid	115	114	107	98	88
Cash expenses	468	549	570	584	582
Total expenses	561	650	671	685	683
FINANCIAL SUMMARY(000)					
Cash flow	11	73	85	102	113
Profit (000)	-81	-28	-15	2	12
Accum loan pymnts	10	83	169	272	384

TABLE 4. Effect on Management Analysis of Adding Dairy Enterprise

	Average of 36 Wisconsin farms	Jon-De before	Jon-De after
SIZE OF BUSINESS			
Number of cows	68.7	88.0	394
\$ milk sold(000)	\$212	\$275	\$839
Worker equivalent	2.96	4.42	6.58
Total tillable acres	298	651	651
LABOR EFFICIENCY			
Cows per worker	26.2	20.2	59.8
Pounds milk/worker(000)	494	461	1280
CAPITAL EFFICIENCY			
Farm capital/cow	\$8175	\$12722	\$5740
Mach & equip/cow	\$1568	\$ 1953	\$ 573
Real Estate/cow	\$3657	\$ 5318	\$1188
FINANCIAL SUMMARY			
Net farm worth(000)	\$ 410	\$1476	\$1476
Debt to asset ratio	0.32	0.31	0.62
Farm debt/cow	\$3012	\$6605	\$3968