

Evaluating the Liquidity/Cash Position of an Aquaculture Business: Using Cash Flow Statements

Carole R. Engle¹

Cash flow problems are one of the most common types of financial problems in aquaculture businesses. This is because commercial aquaculture tends to require lots of feed and other inputs that necessitate substantial operating loans and periodic payments. This publication is one in a series on the financial management of aquaculture businesses. Others give overviews of financial management (SRAC Publication No. 4400), business planning (SRAC Publication No. 381), financial position (SRAC Publication No. 4401), and profitability (SRAC Publication No. 4402).

This publication addresses the question of whether the business can generate enough cash when needed to pay its bills (liquidity). Liquidity is a fairly broad concept, and a number of financial indicators can be used to measure it. Of these, the cash flow statement is the most useful means of monitoring the liquidity of a business.

There are two fundamental tools that can be used to address cash position—cash flow statements and cash flow budgets. A cash flow statement is based on the past year's monthly expenses and revenue. The previous year's cash flow statement is then used to develop a cash flow budget that projects expected cash revenue and expenses for the coming year.

The previous year's cash flow statement and the cash flow budget for the coming year can be used to examine a number of important management decisions. For example, high feed prices mean more operating capital

is necessary to feed fish. Careful cash flow planning can identify ways to ensure that adequate operating capital is on hand when necessary to produce yields consistent with efficient production. Cash flow analysis also can be used to determine whether there is a liquidity problem (i.e., whether there will be a cash shortfall), in which months the problem will occur, and whether the business can make its payments on time.

Cash flow budgets quantify the pattern of cash flow on the farm and are a firm basis from which to structure an effective line of operating capital. This formal presentation of repayment capacity is helpful when approaching a bank to apply for credit. The cash flow budget also clarifies the best months in which to make capital purchases or to purchase supplies.

Cash flow budgets are best structured on a monthly basis and are developed for the entire farm business. Total cash inflow is recorded for each month, and total cash outflow is itemized by type of expense. The difference between the cash inflow and outflow is the amount of cash available for that month. To meet all cash flow needs, the cash available at the end of each month must be positive. Otherwise, new borrowing will be needed to meet all financial obligations for that month. The ending cash balance for that month is determined by adjusting for any new borrowing. The ending cash balance for a month becomes the beginning cash balance for the next month.

Table 1 presents a detailed example of a cash flow budget for a 256-acre catfish farm. Total cash inflow includes the beginning cash available from the previ-

¹Aquaculture/Fisheries Center, University of Arkansas at Pine Bluff

Table 1. Monthly cash flow budget for a 256-acre catfish farm with financing of 30 percent of all capital and restricted sales because of off-flavor.

Item	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Beginning cash	173,650	168,349	127,130	84,788	90,111	82,262	39,195	10,000	10,000	10,000	6,169	10,000	
Catfish sold, lb	23,040	23,040	23,040	103,680	57,600	57,600	34,560	57,600	57,600	97,920	40,320	0	576,000
Catfish receipts, \$	16,128	16,128	16,128	72,576	40,320	40,320	24,192	40,320	40,320	68,544	28,224	0	403,200
Total cash inflow	189,778	184,477	143,258	157,364	130,431	122,582	63,387	50,320	50,320	78,544	34,393	10,000	1,214,854
Operating cash expenses													
Feed	2,783	5,565	5,565	19,479	13,913	44,522	44,522	55,653	55,653	16,696	8,348	5,565	278,264
Fingerlings	0	36,416	36,416	0	0	0	0	0	0	0	0	0	72,832
Labor													0
12-mo., full-time	3,245	3,245	3,245	3,245	3,245	3,245	3,650	3,245	3,650	3,245	3,650	3,650	40,560
Seasonal, full-time	0	0	0	0	1,521	2,535	2,535	2,535	1,014	0	0	0	10,140
Plankton control	0	0	0	0	922	0	922	0	1,843	0	0	0	3,687
Gas, diesel and oil	1,137	568	568	568	947	1,516	2,463	2,463	3,031	3,031	1,326	1,326	18,944
Electricity	1,137	1,137	1,705	2,273	2,842	5,683	8,525	9,661	9,661	9,661	2,842	1,705	56,832
Repairs and maint.	2,980	497	993	993	1,242	2,483	3,228	3,228	2,483	1,242	1,242	4,221	24,832
Bird depredation	240	240	240	160	80	0	0	0	0	160	240	240	1,600
Seining and hauling	1,152	1,152	1,152	5,184	2,880	2,880	1,728	2,880	2,880	4,896	2,016	0	28,800
Telephone	215	215	161	269	269	215	215	215	215	215	215	269	2,688
Office supplies	225	28	141	56	563	563	282	141	141	113	141	422	2,816
Farm insurance	518	518	518	518	518	518	583	518	583	518	583	583	6,476
Legal/accounting	156	125	125	125	125	125	125	125	125	125	125	156	1,562
Total op. expenses	13,788	49,706	50,829	32,870	29,067	64,285	68,778	80,664	81,279	39,902	20,728	18,137	550,033
Debt servicing													
Real estate													
Interest	0	0	0	0	0	0	0	0	0	0	0	44,835	44,835
Principal	0	0	0	0	0	0	0	0	0	0	0	20,544	20,544
Subtotal	0	0	0	0	0	0	0	0	0	0	0	65,379	65,379
Equipment													
Interest	0	0	0	0	0	0	0	0	0	0	24,726	0	24,726
Principal	0	0	0	0	0	0	0	0	0	0	77,514	0	77,514
Subtotal	0	0	0	0	0	0	0	0	0	0	102,240	0	102,240
Operating													
Interest	695	695	695	3,126	1,737	1,737	1,042	1,737	1,737	2,952	1,216	0	17,369
Principal	6,946	6,946	6,946	31,257	17,365	17,365	10,419	17,365	17,365	29,521	12,156	0	173,651
Subtotal	7,641	7,641	7,641	34,383	19,102	19,102	11,461	19,102	19,102	32,473	13,372	0	191,020
Total debt servicing	7,641	7,641	7,641	34,383	19,102	19,102	11,461	19,102	19,102	32,473	115,612	65,379	358,639
Total cash outflow	21,429	57,347	58,470	67,253	48,169	83,387	80,239	99,766	100,381	72,375	136,340	83,516	
Cash available	168,349	127,130	84,788	90,111	82,262	39,195	-16,852	-49,446	-50,061	6,169	-101,947	-73,516	
New borrowing	0	0	0	0	0	0	26,852	59,446	60,061	0	111,947	83,516	
Ending cash	168,349	127,130	84,788	90,111	82,262	39,195	10,000	10,000	10,000	6,169	10,000	10,000	
Summary of debt outstanding													
Real estate													
Equipment													
Operating	166,705	159,759	152,813	121,556	104,191	86,826	103,259	145,340	188,036	158,515	258,306	341,822	

ous month as well as any receipts from the sale of catfish in that particular month. Each type of operating cash expense is then itemized in the budget with appropriate amounts recorded for each month. These are summed to obtain total cash operating expenses by month. The next portion of the cash flow budget includes debt servicing payments for each loan for each month. It is most helpful if these are divided into principal and interest payment amounts. Separating the interest from the principal portion of the payment facilitates calculation of the various financial ratios that provide more detailed insight into cash position and risk. It is also useful to maintain a running balance of the amount of debt outstanding for each month. This allows for easy tracking of the operating line of credit to determine whether it increases or decreases throughout the year. The example in Table 1 shows that new borrowing of \$26,852 was needed to meet financial obligations in July and ensure that the ending cash balance was positive, with at least \$10,000 to begin August 1. The new borrowing was added to the operating capital line in the portion of the cash flow budget that records the outstanding farm debts, which increased the outstanding operating capital debt from \$86,826 to \$103,259.

A series of financial indicators can be calculated from the cash flow budget. Some of the more useful are those that measure cash flow risk in the business. Examples include 1) the percent that farm revenue can decline and still meet cash flows, 2) the percent that farm expenses can increase and still meet cash flows, and 3) the percent that interest rates can increase and still meet cash flows. These measures show the manager whether cash flow on the farm is more vulnerable to fluctuations in the price of fish, expenses on the farm, or interest rates, so that the manager can identify strategies for coping with the most important sources of risk. For the 256-acre catfish farm example, farm revenue can decline by 14 percent and still meet cash flows (Table 2). However, this farm cannot tolerate more than a 6 percent increase in farm expenses. Thus, this farm must pay close attention to its expenses as the source of the greatest amount of cash flow risk.

Table 2. Cash flow risk measures, 256-acre catfish farm.

Measure	Value
Cash flow risk	
Percent farm cash revenue can decline and still meet cash flows	14%
Percent farm cash expenses can increase and still meet cash flows	6%
Percent interest rates can increase and still meet cash flows	14%

A farm's accountant can prepare cash flow statements and budgets for the farm, or the farmer can maintain his/her own. For farmers who wish to maintain their own cash flow budgets, there are several options. Some financial software packages include cash flow budgeting options; others, such as FINPACK (from the Center for Farm and Financial Management, University of Minnesota), are specific for farming businesses. A simple spreadsheet tool (and tutorial) is available to the public from the Aquaculture/Fisheries Center of the University of Arkansas at Pine Bluff. It explains how to develop cash flow budgets and includes a template that can be used to enter farm values and manage cash position.

Table 3 shows how manipulating cash flow can affect a business. Farms A and B both have \$270,000 of annual revenue. However, Farm A receives most of its revenue in the latter part of the year and Farm B has its revenue spread out over more months during the year. The liquidity measures are very different for the two farms. Farm A, with most of its revenue concentrated in just a few months towards the end of the year, has mostly negative indicators of cash position, debt servicing, and cash flow risk, whereas Farm B has all positive indicators.

Cash flow budgets, if monitored monthly, can be used to improve the overall management of the farm business. Any month with a negative cash flow is a cash flow problem

Table 3. Effects of two patterns of cash flow on cash position, debt-servicing, and cash flow risk.

Category	Farm A	Farm B
Months in which sales revenue is received		
February	0	\$60,000
April	0	\$60,000
July	0	\$60,000
September	\$60,000	\$60,000
October	\$90,000	0
November	\$60,000	\$30,000
December	\$60,000	0
Total	\$270,000	\$270,000
Liquidity measures		
Cash flow coverage ratio ^a	-0.26	0.17
Debt-servicing ratio ^b	0.21	0.17
Cash available divided by cash inflow	-0.02	0.01
Cash available divided by operating expenses	-0.03	0.02
Cash available divided by liabilities	-0.01	0.01

^a Calculated from the cash flow budget by dividing the excess available cash by the cash required for interest and principal payments.

^b Calculated from the cash flow budget by dividing the cash required for interest and principal payments by the total cash available.

that needs to be resolved as quickly as possible by modifying the overall production/financial plan to generate revenue when needed. Cash flow shortfalls are best resolved early to avoid compounding the magnitude of cash shortages later. Decisions on stocking and feeding rates should be based on meeting short-term financial obligations such as payments on loans. A farmer may need to sell off stocks of fish to generate cash in the near term. Reducing stocking densities also allows fish to grow faster, reach market size earlier, and improve cash flow later in the season.

Winter months are a good time to develop a detailed cash flow budget to identify when payments are required and when cash shortfalls are likely to occur. Software programs such as Fishy can be used to project harvest dates and compare the cash flow effects of various stocking and feeding rates. Those feeding and stocking rates that allow the farmer to make necessary payments should be selected. Farms with projected cash deficits may choose to stock at lower rates to maximize fish growth and the turnover of the crop. Larger fish stocked in ponds will reach harvest weight in less time.

As an alternative to Fishy, a Cash Flow Simulator has been developed by the Aquaculture/Fisheries Center at the University of Arkansas at Pine Bluff (Engle et al., 2009a, b, c). This is an Excel-based spreadsheet that helps farmers calculate the quantities of fish to be sold by month. There are two versions of the Simulator. The Cash Flow Simulator identifies quantities to be harvested by month when there are no restrictions on operating capital. The Cash Flow Simulator with Limited Operating Capital evaluates feeding strategies when operating capital is limited. The latter has been used by catfish farmers to calculate the total amount of capital available to purchase feed for the year and then allocate that amount of feed across ponds to determine which allocation ends up with the best cash flow.

Monitoring cash flow on a monthly basis is the single most important financial analysis activity for maximizing the chances of financial success in the short run.

Combined with the annual assessment of financial position (from the balance sheet) and profitability (from the income statement), it will help farmers make decisions that keep their businesses financially sound.

References

- AgPlan. 2010. University of Minnesota, St. Paul, Minnesota. www.agplan@umn.edu.
- Engle, C.R. 2012. Assessing the Financial Position of an Aquaculture Business: Using Balance Sheets. SRAC Publication No. 4401. Southern Regional Aquaculture Center, Stoneville, Mississippi.
- Engle, C.R. 2012. Determining the Profitability of an Aquaculture Business: Using Income Statements and Enterprise Budgets. SRAC Publication No. 4402. Southern Regional Aquaculture Center, Stoneville, Mississippi.
- Engle, C.R. 2010. Aquaculture economics and financing: management and analysis. Ames, Iowa: Blackwell Scientific.
- Engle, C.R., S. Pomerleau, and G. Kumar. 2009a. Tools for financial management of baitfish and goldfish farms. CD-ROM. University of Arkansas at Pine Bluff, Pine Bluff, Arkansas. Also available at www.uaex.edu/aquaculture/economics.
- Engle, C.R., S. Pomerleau, and G. Kumar. 2009b. Tools for financial management of catfish farms. CD-ROM. University of Arkansas at Pine Bluff, Pine Bluff, Arkansas. Also available at www.uaex.edu/aquaculture/economics.
- Engle, C.R., S. Pomerleau, and G. Kumar. 2009c. Tools for financial management of fish farms. CD-ROM. University of Arkansas at Pine Bluff, Pine Bluff, Arkansas. Also available at www.uaex.edu/aquaculture/economics.
- Engle, C.R. and N.M. Stone. 1997. Developing business proposals for aquaculture loans. SRAC Publication No. 381, Southern Regional Aquaculture Center, Stoneville, Mississippi.

The views expressed in this publication are those of the authors and do not necessarily reflect those of USDA or any of its subagencies. Trade names are used for descriptive purposes only and their use does not imply endorsement by USDA, SRAC, the authors, or their employers and does not imply approval to the exclusion of other products that may also be suitable.

SRAC fact sheets are reviewed annually by the Publications, Videos and Computer Software Steering Committee. Fact sheets are revised as new knowledge becomes available. Fact sheets that have not been revised are considered to reflect the current state of knowledge.



United States
Department of
Agriculture

National Institute
of Food and
Agriculture

The work reported in this publication was supported in part by the Southern Regional Aquaculture Center through Grant No. 2010-38500-21142 from the United States Department of Agriculture, National Institute of Food and Agriculture.