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PROFITABILITY, FINANCIAL LIQUIDITY AND LABOUR EFFICIENCY IN FISHERY AND AGRICULTURAL ENTERPRISES

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ABSTRACT. The aim of the study was to compare profitability, financial liquidity and labour efficiency in fishery and agricultural farms and enterprises. Fishery enterprises were represented by 54 pond fish farms and 38 lake fishery enterprises, while agricultural ones - by 176 complex enterprises, 129 farms focusing on plant production, and 52 animal farms. Data for fishery enterprises were collected in 1994-1996, and for agricultural ones in 1996. Means were calculated for the following indices: profitability, index of current financial liquidity, rapid index of financial liquidity and labour efficiency. To illustrate the results advantage was taken of linear and frame graphs and histograms.

It was found that pond fish farms distinctly differed from other enterprises (3 out of 4 indices the highest and significantly different). Lake fishery enterprises differed significantly from agricultural ones only as regards rapid index of financial liquidity. The lowest values of the 4 analysed indices were obtained for animal farms. Labour efficiency was the least diversified index.

Key words: FISHERY AND AGRICULTURAL ENTERPRISES, PROFITABILITY, FINANCIAL LIQUIDITY, LABOUR EFFICIENCY

INTRODUCTION

Many fishery enterprises in Poland are engaged not only in lake and pond co-production, but also in typical agricultural activities i.e. plant and animal production. This calls for comparisons of the economic efficiency of these various types of production. The first attempt at such an assessment has already been done (Worniałko 1994) but it was based only on by-production in fishery enterprises, and the materials were collected still in the old economic and political system, when there was no market economy. This paper compares individual enterprises engaged in different production types as follows:

1. pond fish farms,
2. lake fishery enterprises,
3. complex agricultural farms,
4. agricultural farms focusing on plant production,
5. agricultural farms focusing on animal production.

MATERIALS AND METHODS

Materials representing fish farms and fishery enterprises originated from questionnaire surveys performed in 1994-1996. Three years were taken into account to ensure proper sample sizes for these farms and enterprises. Totally there were 38 lake fishery enterprises and 54 pond fish farms. In case of labour efficiency consideration was given to one year only (1996), and then sample sizes decreased to 16 and 18 respectively.

Materials pertaining to agricultural farms were taken from the ranking list for 1996, prepared by the Institute of Agricultural and Food Economics for the so-called post-state agricultural farms. Data were available for 176 complex farms, 129 farms focusing on plant production, and 52 farms engaged in animal production.

The following economic parameters were compared:

- profitability of production,
- index of current financial liquidity,
- rapid index of financial liquidity,
- labour efficiency index.

Indices of profitability and labour efficiency were calculated in a specific way presented in Table 1. It was adapted from the ranking list for 1996 issued by the Institute of Agricultural and Food Economics.

TABLE 1

Methods of calculating the analysed indices

Index	Calculation method
Index of operating profitability (%)	ratio between gross financial result and sum of incomes from product sale and other operating and financial incomes $\times 100$
Index of current financial liquidity	ratio between operating assets and short-term financial obligations at the year's end
Rapid index of financial liquidity	ratio between operating assets less the reserves and short-term obligations at the year's end
Labour efficiency (in thousand PZL per employee)	ratio between added value (i.e. sum of: net financial result, depreciation, all taxes and fees regarded as costs, lease rent, financial obligations, costs of external capital (interest) and costs of wages and social securities) and average employment

Mean values of the indices were compared within and between particular groups of farms and enterprises, establishing significance of the differences. Student's t-test

was used and level of significance 0.01 was accepted. The following types of figures were used to illustrate and make the comparisons more evident:

1. linear graph of the mean values of the analysed indices presented together for all types of farms and enterprises,
2. frame graphs for pairs of compared farms and enterprises, which illustrate the results of t-test and show proportions of standard error of the means, and standard deviation,
3. categorised histograms showing frequencies of particular values of the indices in the analysed types of farms and enterprises.

RESULTS AND DISCUSSION

A. DIFFERENCES IN THE MEAN PROFITABILITY OF PARTICULAR FARM AND ENTERPRISE TYPES

The highest mean profitability, amounting to 15.6% and much higher than in other enterprises, was observed in pond fish farms (Fig. 1). This value differed in a statistically significant way from all other values of profitability index (Tab. 2). Profitability of 8.6% obtained for lake fishery enterprises (Fig. 1, Tab. 2) did not differ in a significant way from the values obtained for the three types of agricultural enterprises. On the other hand, there was a statistically significant difference between the lowest mean profitability of animal farms (5.8%) and mean profitability of the other two types of agricultural enterprises viz. complex farms (9.4%) and farms focusing on plant production (10.1%) (Fig. 1, Tab. 2).

TABLE 2

Mean values of the analysed indices				
Enterprise type	Profitability of operations	Index of current liquidity	Rapid index of liquidity	Labour efficiency
Pond fish farms	15.6 %	10.2	8.1	28.5
Lake fishery enterprises	8.6 %	3.7	3.1	23.3
Complex agricultural farms	9.4 %	3.6	0.9	29.1
Plant farms	10.1 %	4.0	1.1	30.4
Animal farms	5.8 %	3.1	0.7	21.2

Profitability indices were the most alike in complex agricultural enterprises and plant farms. Frame graph (Fig. 2) reveals that variability ranges determined by

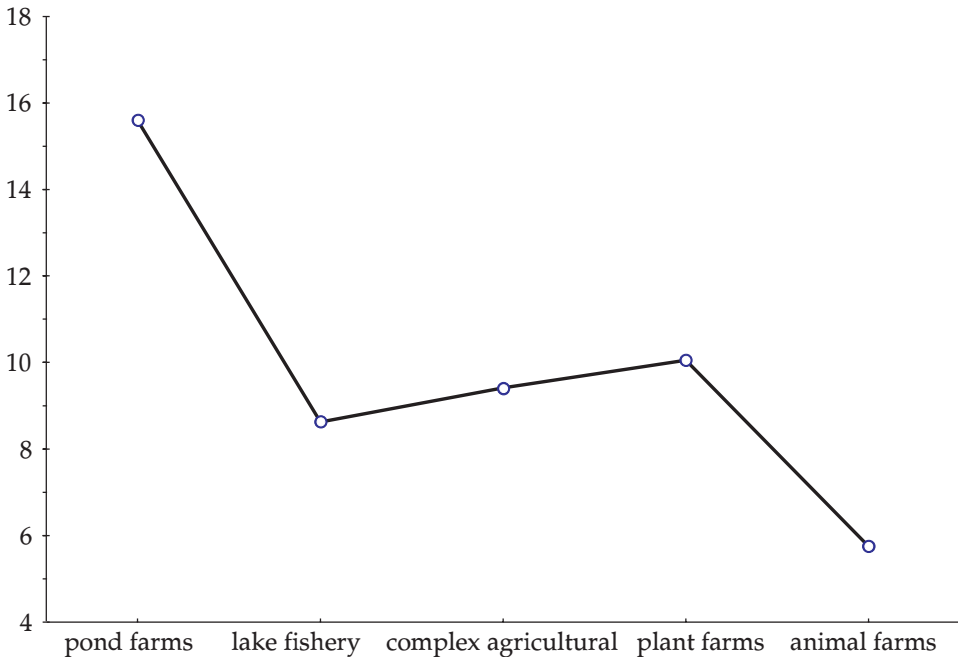


Figure 1. Mean values of profitability index in the analysed types of enterprises

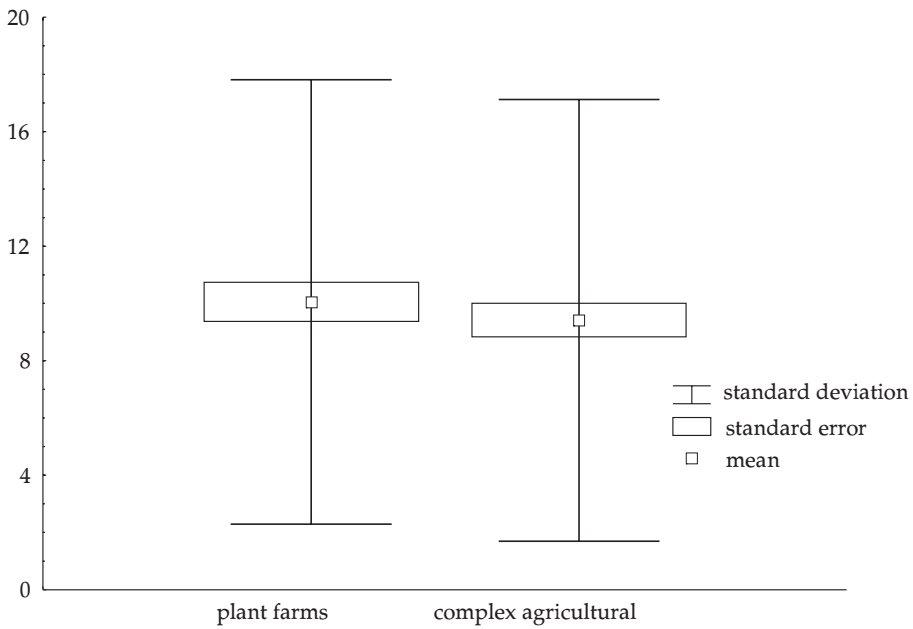


Figure 2. Comparison of mean profitability indices, standard errors and deviations in complex agricultural and plant farms

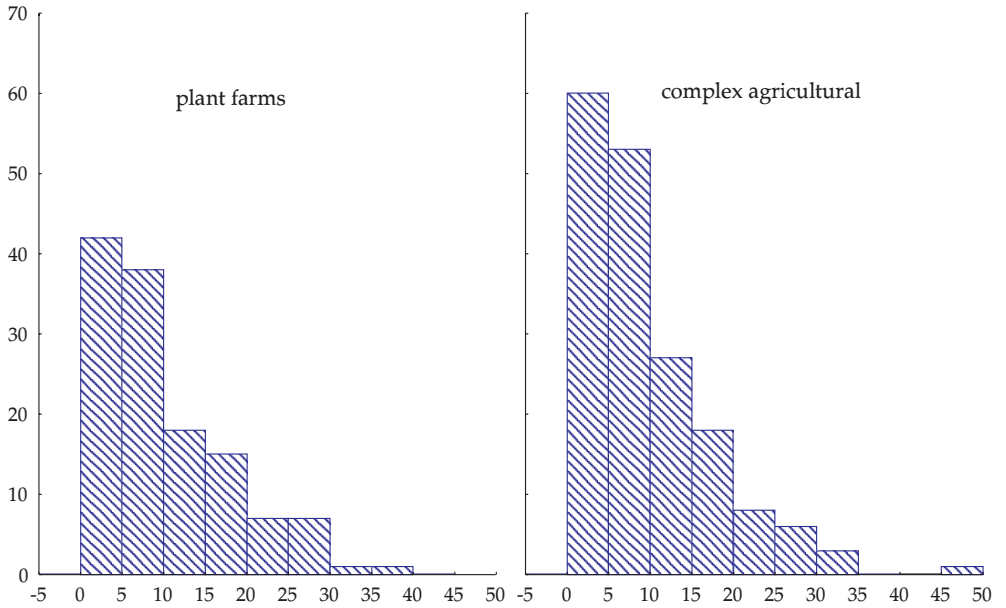


Figure 3. Comparison of the frequency of particular values of profitability index in complex agricultural and plant farms

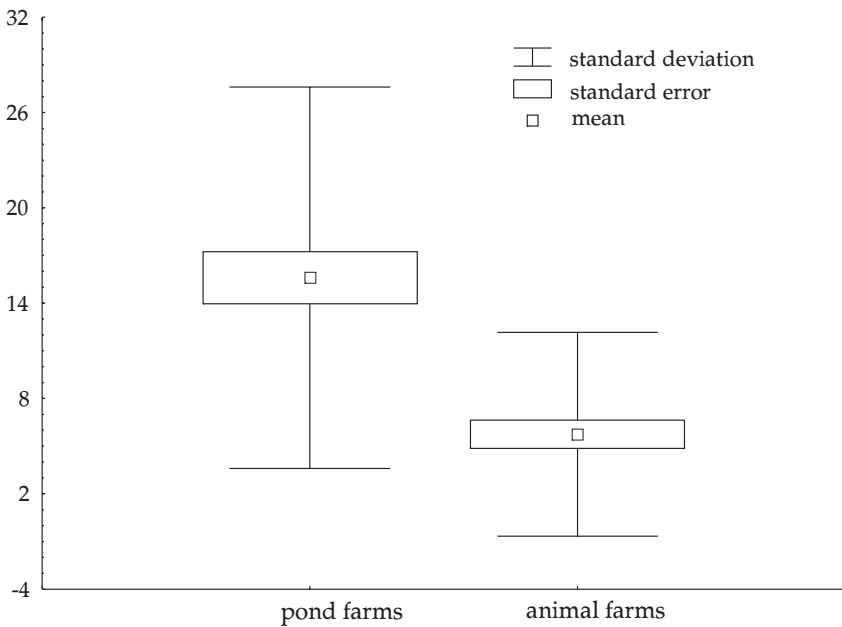


Figure 4. Comparison of mean profitability indices, standard errors and standard deviations in pond fish farms and animal farms

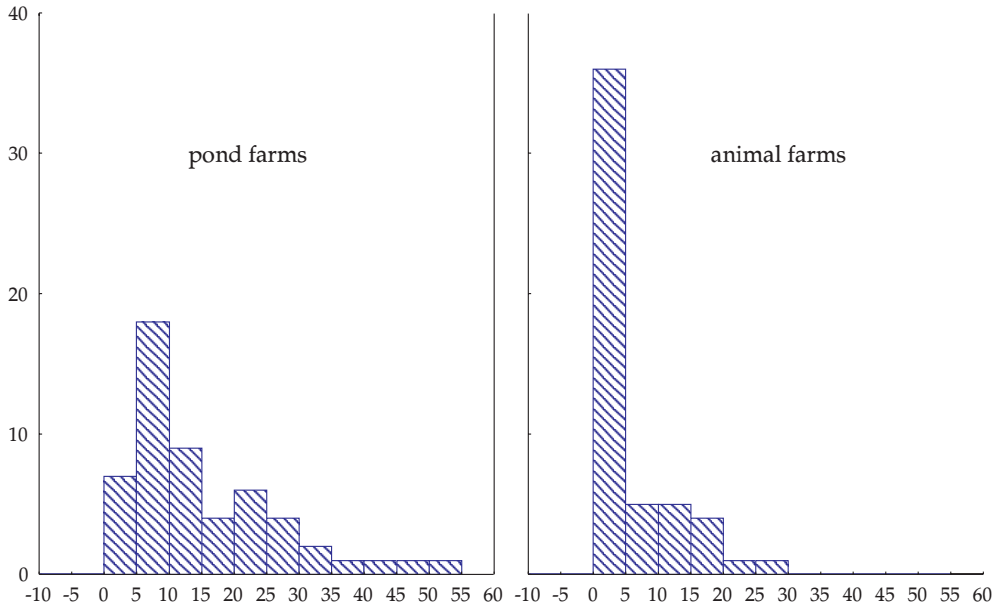


Figure 5. Comparison of the frequency of particular values of profitability index in pond fish farms and animal farms

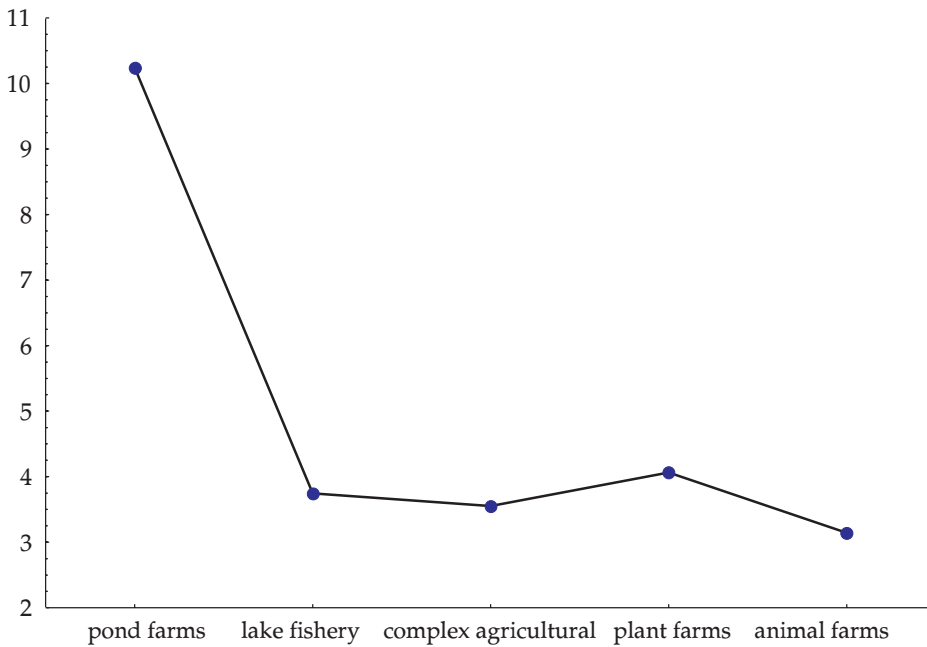


Figure 6. Mean values of the index of current financial liquidity in different types of enterprises

standard deviations were almost the same for the two types of farms, and that fields of standard error partly overlapped. Also frequencies of particular profitability indices were very similar as illustrated by the histograms (Fig. 3).

The greatest differences of profitability indices were observed between pond fish farms and agricultural animal farms. These differences were of a triple character:

1. there was an over two-fold difference in the mean value of this index;
2. there was an almost two-fold difference in the range of variations, this being well illustrated by Fig. 4;
3. in animal farms one value of profitability index (up to 5%) dominated, whereas in pond fish farms profitability indices differed considerably (Fig. 5).

The lowest profitability of agricultural farms focusing on animal production seems to confirm the conclusion that additional animal production carried out in pond fish farms had a negative effect on their profitability. This conclusion was formulated based on the materials from before the economic reform (Worniałko 1994).

B. DIFFERENCES IN THE MEAN VALUES OF FINANCIAL LIQUIDITY INDICES

Two indices were used to assess financial liquidity: of current liquidity and rapid index. Both appeared to be the highest (10.2 and 8.1 respectively) and significantly different from other values in the group of pond fish farms (Fig. 6 and 7). As can be seen in these figures the indices of current financial liquidity for lake fishery enterprises (3.7) and for the three agricultural farms: complex (3.6), plant (4.0) and animal (3.1) did not differ in a significant way. On the other hand, rapid index of financial liquidity of lake fishery enterprises (3.1) differed significantly from these indices obtained for agricultural enterprises (complex farms - 0.9, plant farms - 1.1, animal farms - 0.7). The difference between rapid index of liquidity and index of current liquidity was the smallest for lake fishery enterprises. This suggests that these enterprises were characterised by the lowest level of reserves (Sierpińska and Jachna 1993).

Different character of pond fish farms as regards their current financial liquidity is well illustrated by a frame graph, which compares standard errors and range of variations for pond fish farms and lake fishery enterprises (Fig. 8). The differences are almost three-fold. Also the histograms of the rapid index (Fig. 9) reveal that pond fish farms differed considerably from other enterprises. The index in

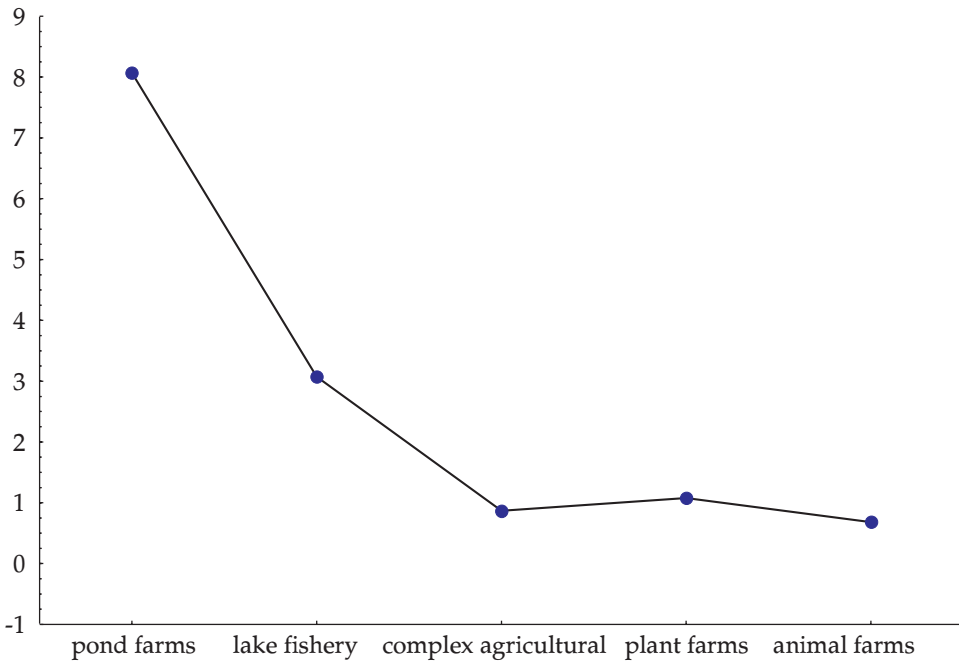


Figure 7. Mean values of the rapid index of financial liquidity in different types of enterprises

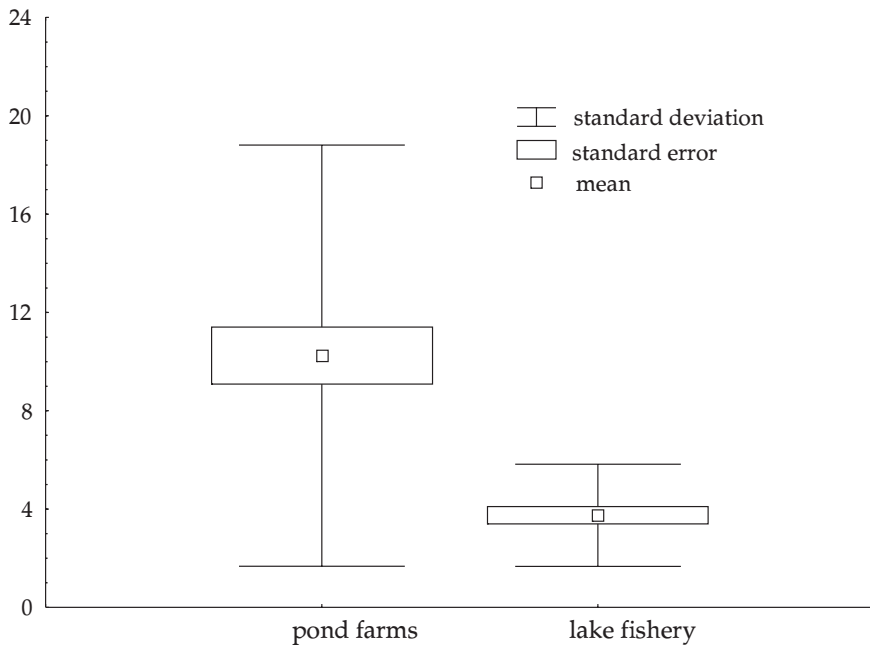


Figure 8. Comparison of the mean indices of current financial liquidity, standard errors and standard deviations in pond farms and lake fishery enterprises

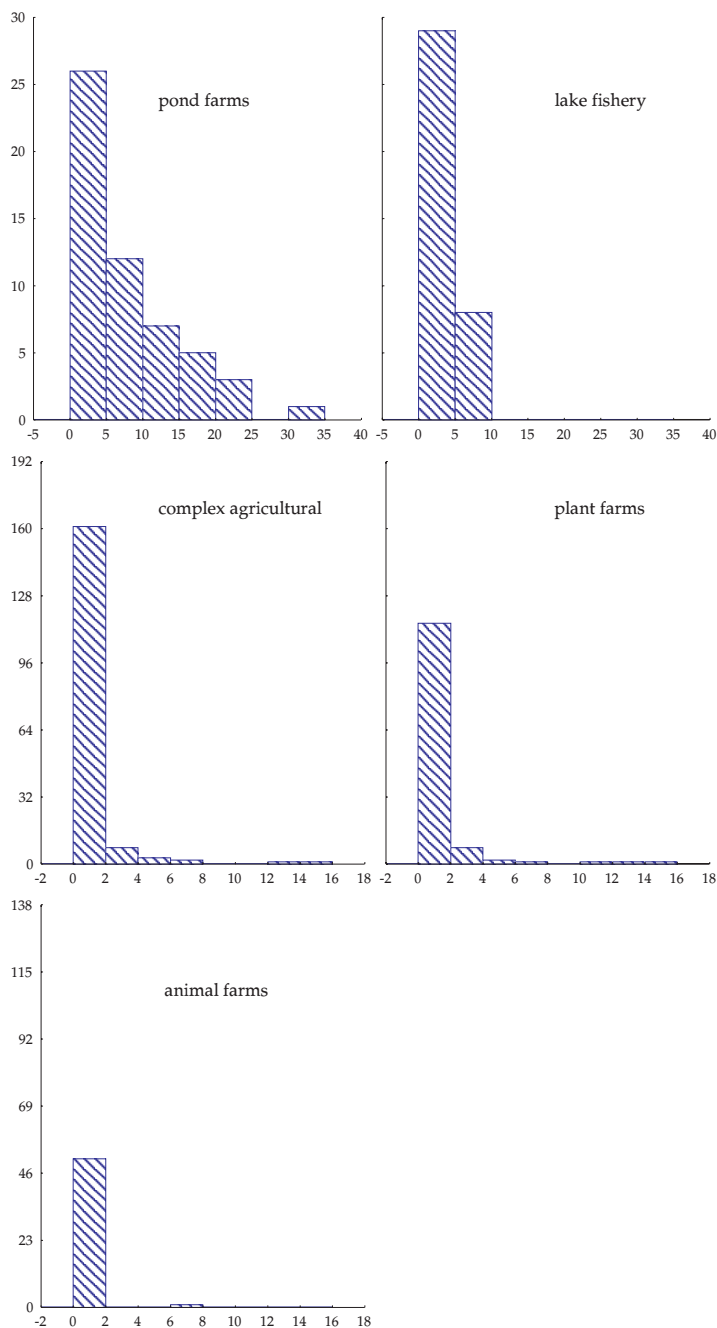


Figure 9. Comparison of the frequency of particular values of the rapid index of financial liquidity in particular types of farms

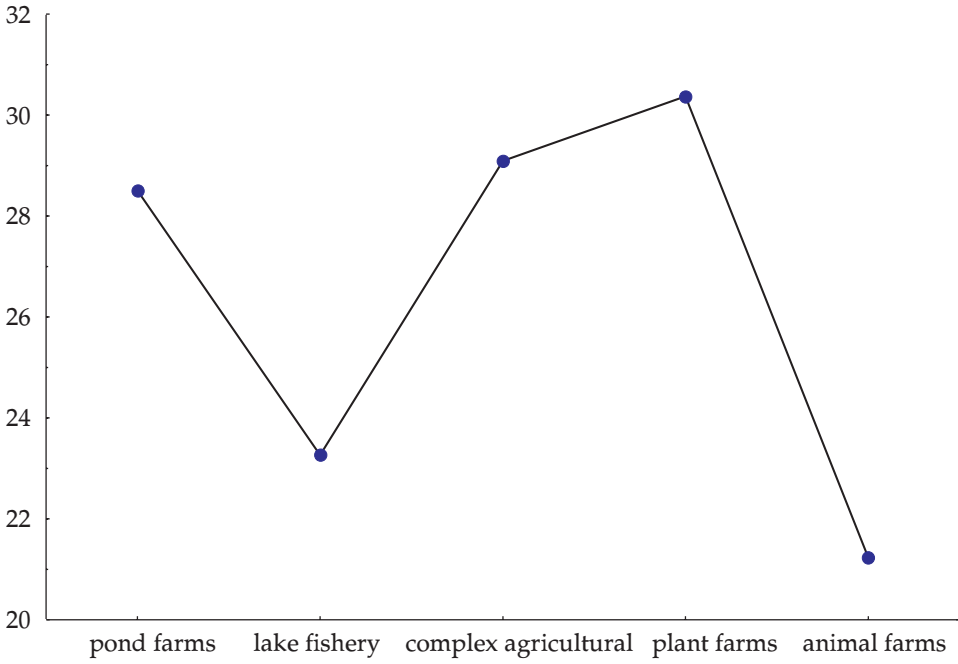


Figure 10. Mean values of labour efficiency in different types of enterprises

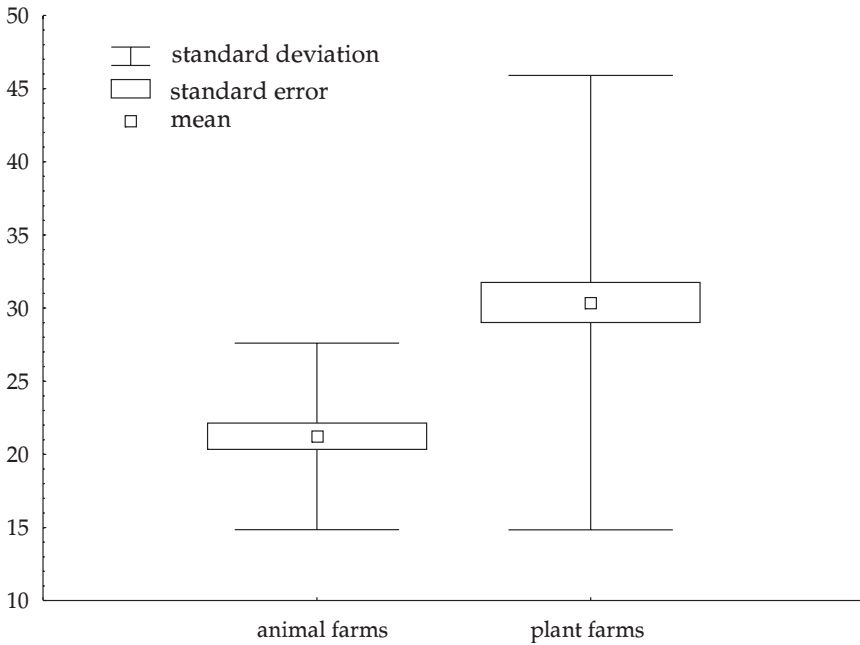


Figure 11. Comparison of the mean indices of labour efficiency in plant and animal farms

question varied within a much wider range in these farms. This resulted in untypically high mean values of the two indices of liquidity in pond fish farms: 10.2 and 8.1 respectively, when the accepted norm is 1.0 to 2.9 (Bień 1997, Kowalski 1996, Sierpińska and Jachna 1993). High values of the index of current liquidity and rapid index of liquidity in pond fish farms have been discussed in another paper (Worniało, in print), where it was concluded that this feature was specific of pond fish farms.

In most cases the mean indices of financial liquidity were higher than the norm. Only complex agricultural enterprises and animal farms were characterised by a little too low values of the rapid index. It is worth citing here some data available from the literature; it appears that the mean value of current financial liquidity in the experimental agricultural farms amounted to 1.13, and the mean value of rapid index was 0.31 (Gołas and Wysocki 1993). On the other hand, in nine Polish Stations of Animal Breeding and Insemination surveyed in 1992-1996 only in 8 cases out of 90 observations the indices of financial liquidity (current and rapid) were lower than 1.0 (Morstin and Burchard 1998).

C. DIFFERENCES IN LABOUR EFFICIENCY

Graphic presentation of the mean values of labour efficiency revealed that the obtained pattern was quite different than in case of the other economic indices (Fig. 10). The highest labour efficiency was observed in plant farms (30.4). Similar values (no statistically significant difference) were obtained for complex agricultural farms (29.1) and pond fish farms (28.5). Animal farms were noticeably worse, with the mean labour efficiency index of only 21.2. This value was statistically significantly different than the other ones. On the other hand, mean labour efficiency in lake fishery enterprises (23.3) did not differ significantly from other values.

Mean labour efficiency in the analysed farms and enterprises was not very variable as can be seen from the frame graph (Fig. 11). This graph compares farms characterised by the highest (plant farms) and the lowest (animal farms) values. Ranges of variations of the other three types of enterprises do not exceed that for plant farms, and the obtained mean values and standard errors are located between the two means presented in Fig. 11. Also the histograms did not differ much. The only regularity was that as the sample size increased, so did the range of variations, which tended to shift towards more satisfactory, higher values.

CONCLUSIONS

1. Analysis of some economic parameters showed that the best results were obtained in pond fish farms. These farms achieved the highest indices, significantly different from the values obtained for other types of farms and enterprises.
2. Lake fishery enterprises were better than agricultural farms only as regards rapid index of financial liquidity.
3. The lowest values of the analysed economic indices were found in agricultural farms which focused on animal production.
4. The lowest variations of the mean values were observed with respect to labour efficiency.

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STRESZCZENIE

RENTOWNOŚĆ, PŁYNNOŚĆ FINANSOWA I WYDAJNOŚĆ PRACY W GOSPODARSTWACH RYBACKICH I ROLNYCH

Celem badań było porównanie rentowności, płynności finansowej i wydajności pracy w gospodarstwach rybackich i rolnych. Gospodarstwa rybackie reprezentowane były przez 54 gospodarstwa stawowe i 38 jeziorowych a gospodarstwa rolne - przez 176 gospodarstw wielostronnych, 129 o ukierunkowaniu roślinnym i 52 o ukierunkowaniu zwierzęcym. Dane dla gospodarstw rybackich pochodziły z lat 1994-1996, a dla rolnych z r.1996. Wyliczono średnie wielkości następujących wskaźników: rentowności działalności gospodarczej, wskaźnika bieżącej płynności finansowej i tzw. szybkiego oraz wydajności pracy (sposoby obliczania poszczególnych wskaźników podano w osobnej tabeli). Istotność różnic między średnimi ustalono przy pomocy testu t . Posłużono się również wykresami średnich wielkości

wskaźników, wykresami ramkowymi (informującymi dodatkowo o wielkościach standardowych błędów i odchyłen) oraz skategoryzowanymi histogramami (ilustrującymi częstość występowania różnych wielkości badanych wskaźników). Stwierdzono, że najbardziej wyróżniały się gospodarstwa stawowe, które osiągnęły trzy najwyższe wskaźniki istotnie różne od wskaźników pozostałych gospodarstw (wskaźnik rentowności i oba wskaźniki płynności finansowej). Gospodarstwa jeziorowe różniły się w istotny statystycznie sposób od gospodarstw rolnych jedynie wyższym szybkim wskaźnikiem płynności. Najniższe wielkości wszystkich czterech wskaźników uzyskały gospodarstwa rolne o ukierunkowaniu zwierzęcym. Najmniejsze zróżnicowanie średnich wielkości wskaźników badanych typów gospodarstw wystąpiło w przypadku wydajności pracy.

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