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Sea bass & bream in floating cages in Turkey

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SUMMARY - This presentation has been prepared on experimental data on the basis of our company's background of 8 years in the sector, as well as our regular contacts with the other fish farms because of marketing and distribution of juveniles from our hatchery, and giving the ecological conditions, meteorological conditions of the locations in Turkey, production systems, capacity of the functioning hatcheries and fish farms, employment of the sector, zootechnical standards, marketing conditions, investments, economic aspects and the economic results of small scale sea bass and sea bream in floating cages in Turkey.

Key words: Sea bass, sea bream, floating cages.

RESUME - Cette présentation est basée sur les informations résultant de l'expérience de notre compagnie, issue de 8 ans de recherche dans le secteur aquacole, et de nos contacts réguliers avec les autres fermes marines (type P.M.E et artisanales) grâce à la commercialisation des alevins provenant de l'éclosérie AMMA Ltd. conçue et dirigée par le bureau d'études français SIAM. Sont présentés : les conditions écologiques, météorologiques, et géographiques ; les systèmes, standards zootechniques et capacités de production des écloséries et des fermes de grossissement ; la situation de l'emploi dans le secteur ; les investissements, les paramètres et résultats économiques ; l'état du marché.

Mots-clés: Loup, daurade, cages.

General information

Fish farming sector and locations in Turkey

There are about 140 licensed ongrowing sites in Turkey, rearing Gilt Head Sea Bream and Sea Bass. Their annual production capacity is ranging 10 to 300 tonnes. They are mostly located in the Aegean coast line and partly in Mediterranean. 4-5 of them are land based and remaining majority is sea based in floating cages. Most of these farms are located between midwest and south west parts of Anatolian peninsula.

Land based sites are earth pond systems with brackish water or directly sea water circulation and have a capacity of 400-500 tonnes *per annum*.

Meteorological conditions

Sea water temperature is 14-16°C from November to April and 16 to 26°C from April to November. There is no sharp decrease or increase in the sea water temperature and the variation occurs gradually. Salinity is 38-39 pt.. in Aegean Sea and 41 pt.. in Mediterranean. Effective winds are in winter but the fish farms' locations are somehow protected (Fig. 1).

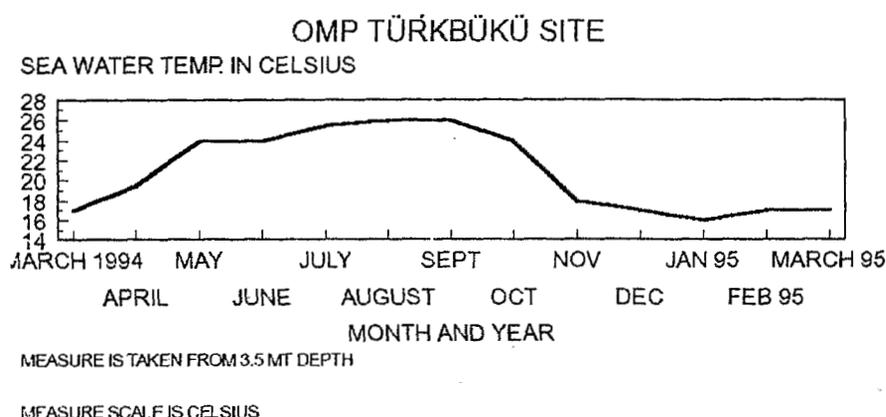


Fig. 1. Sea water temperature 1994-1995.

There is no pollution in the sea water and the quality is extremely good. Vast majority of the farms have sufficient sea water currents and any of a farm has not been facing bottom pollution or contamination from the sea.

Production capacity

Total production capacity is varying between 3 500 tonnes and 7 000 tonnes of production and the difference is because of the amount of the Sea Bream juvenile capture from the nature. Ministry of Agriculture is allowing fish farms to catch their Sea Bream Juveniles from lagoons after mid-April with the condition of not exceeding 50% of their juvenile requirement. 25% of the total production is sea bass and remaining 75% is sea bream.

Production capacity might be increased considerably in our country but few factors are preventing the development of the sector. Land based ongrowing sites are considered non-feasible and investors prefer sea based farms. But, suitable locations in the sea for the fish farms are encountering with tourism sectors interests and the tourism prevails. There is a huge and frustrating buroucratic procedure to comply with for a new application of a sea based farm's concession. Any of the applications since 1993 have not been granted yet because of the dispute between the Ministries of Tourism and Agriculture. Therefore the quotations of the Ministry and farmers are contradicting eachother (Refererring to Mr. Lacroix).

Administrative aspects

Most of the employees are unqualified and trained and taught in the field by working. Farms are employing at least 2 workers but mostly there is at least one Aquaculture engineer as supervisor. Including the engineers both the hatcheries and ongrowing units employ about 1 000 people. 2 state run and 8 private hatcheries are operating in the sector in Turkey and hatcheries are employing qualified people and the state hatcheries are both training and educating units. 5 aquaculture Faculties are educating engineers and the qualifications of the employees are picking up considerably. Most of the bigger size farms are employing aquaculture engineers both for scientific aspects as well as qualified managers.

Zootechnical standards

Growth

As it can be seen in the attached Figs 2 and 3, we can ongrow sea bass and bream to market size (300 to 330 g per fish) within 12 to 14 months. Turkey's ecological and natural conditions are very convenient for these species.

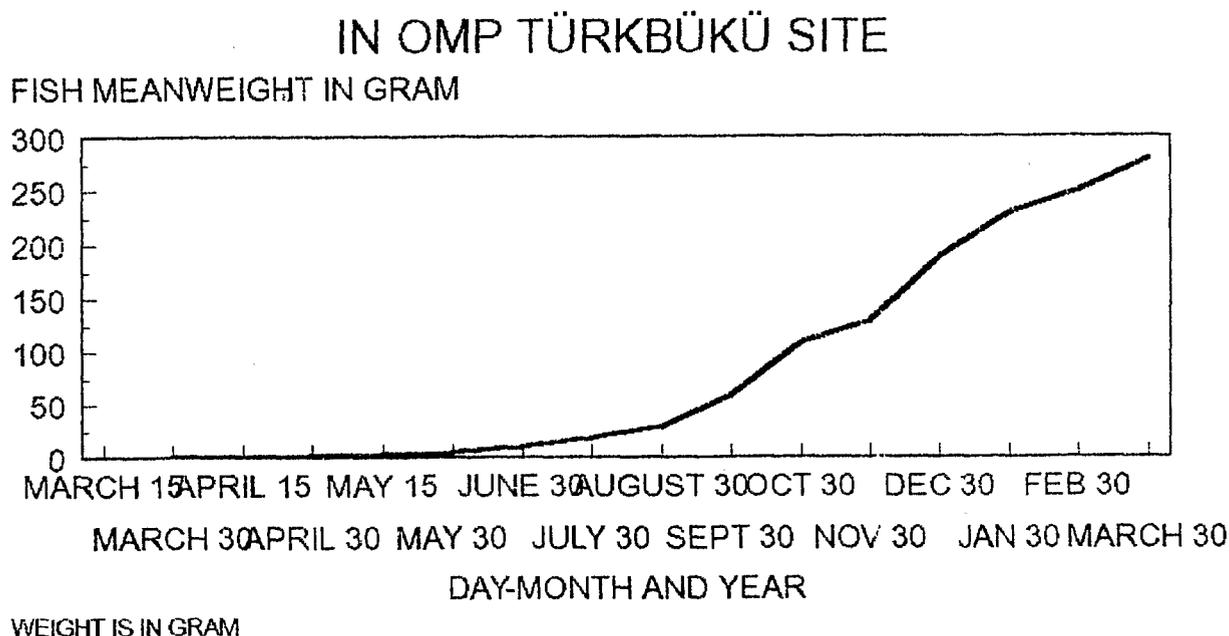


Fig. 2. Sea bass growth in 1994-1995.

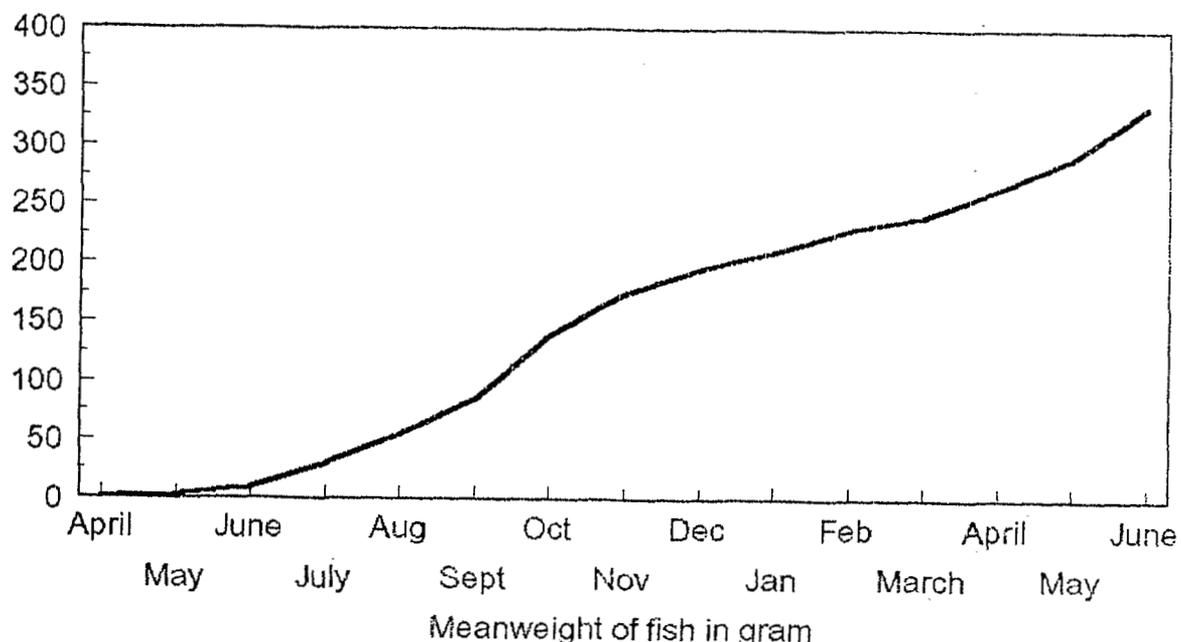


Fig. 3. Growth curve of sea bream.

Survival rate

Survival rate of hatched sea bass juvenile is 75 to 92% in our sites. Basic factors of low mortality is succeeded by low stocking density, grading and good quality of feed. In our company's site we are ending up with a survival rate of 93-94% since 1989. Stock density (40 g and onwards) of bream is 12 to 20 kg / m³ and bass is 10 to 18 kg / m³.

Sea bream juveniles are more successfully reared than bass juveniles. When the juveniles are ponded into the floating cages in the sea after they are 1 g of meanweight, in casual circumstances, the survival rate is almost 95%. But when the fish farmers start catching very small juveniles (such as 0.1-0.2 g) illegally from the nature especially during February and March big mortality and lost occurs.

There is neither hatchery feed nor starter feed production in Turkey. Quite a few fish farmer cannot obtain appropriate feed for the early stages of juveniles and this probably is one of the basic reason of the mortality.

Since 2 years, local Ewos factory is importing starter feed from Ewos-Spain factory and supplying us this feed during juvenile purchase period of the year and it gives big help to the fish farmers.

Food conversion ratio (FCR)

Food conversion ratio was 3 / 1 during previous years, both due to the quality of the fish feed and inexperience of the fish farmers. As the sector started to develop and new feed factories started their production, FCR began decreasing gradually. Although most of the farmers are keen on practising the feeding lists of the factories, they also feed the fish manually according to the biomass in summer time, especially when the sea water temperature exceeds 25°C. Depending upon the time and size of the harvest, FCR is around 2 both for bass and bream.

Marketing conditions

Almost 85% of our country's production is exported and mainly to Italy and partly to Greece and France. According to the regulations of EEC new processing-packing plants have been obligatory and these plants are now complying with the regulations.

Local market also can consume the total production but exporting and having foreign currency is always preferable. Also local market needs an organisation of distribution if one should choose marketing the fish directly instead of selling it to fishmongers. Also local market prefer wild fish to cultured fish.

Considering the fact that the wild captured fish is diminishing year by year, fish farmers are optimistic for the future. Even if the Ministry of Tourism loosens the barriers of bureaucracy in the future, new farms will not be increasing the production above the market demand. A new possibility is the offshore system farming in Turkey but the applications are again being refused by the Ministries because of the dispute amongst themselves.

Also due to the inflation, high investment cost of offshore farming system does not seem interesting for the investors. Therefore high increase is not being expected in the short run and marketing situation will not be changing.

Either for local market or export, fish is chilled, packed inside the Styrofoam boxes, iced and insulated. Different practices can be applied depending upon the demand of client and transportation.

Investments and economic aspects

Here is given a draft budget for a new small scale fish farm in floating cages :

Fix investments

30 Tonnes per year capacity (50% bass and 50% bream).

All the figures are in French Franc.

| | |
|--|--|
| 90,000- | 30 square wooden cages (5 m x 5 m internal dimensions) including the anchors, metal pieces, mooring ropes etc. |
| 85,000- | approx. 1400 kg nets with 3 different mesh size (i.e. 3-9-16 mm) |
| 90,000- | Small truck or lorry |
| 10,000- | Boat, 30 feet, 15 hp outboard engine |
| 40,000- | Cottage for staff and stockade building |
| 25,000- | Miscellaneous equipment and material |
| ----- | |
| 340,000- | Subtotal |
| | |
| Depreciation of nets (for five years) % 20 | : 17,000- |
| Depreciation of cages (for 8 years) % 12.5 | : 11,250- |
| Depreciation of remaining equipment % 10 | : 16,500- |
| ----- | |
| Depreciation's for the first 8 years.... | 44,750- FF per year |

Operational expenditures

For 14 months of production period with 15 tonnes bream and 15 tonnes bass. Mortality is estimated 20% from the juvenile purchase to harvest and the average harvest size of 300 g.

According to the data of the recent years, 60% of our production cost was consisted of juvenile and feed purchase and the remaining 40% is the consumables (Fig. 4). Thus the calculation below is done accordingly. Also due to the decreasing quantity of bream juveniles caught from the nature, bream juvenile suppliant is becoming more costly every year and therefore the profit margin of bream is reduced lately inspite of the increase in the sale price. Hatcheries still do not intend to produce bream juveniles due to the high cost and policies of the Ministry allowing farmers to catch juveniles from the nature.

| | |
|----------|--|
| 108,000- | Sea bream juvenile purchase, 1.8 FF per unit |
| 90,000- | Sea bass juvenile purchase, 1.8 FF per unit |
| 134,550- | Bream feed, FCR 2.3 and feed 3.9 FF per kg |
| 128,700- | Bass feed, FCR 2, feed 3.9 FF per kg |
| 307,500- | Consumable and misc. expenditures |
| ----- | |
| 768,750- | Total operational expenditures |
| 768,750- | Operational expenditures |
| 44,750- | Deprecations |
| ----- | |
| 813,500- | Subtotal for one year |
| 51,250- | Consumables for 2 months |
| 7,500- | Depreciation for 2 months |
| ----- | |
| 872,250- | Production cost |

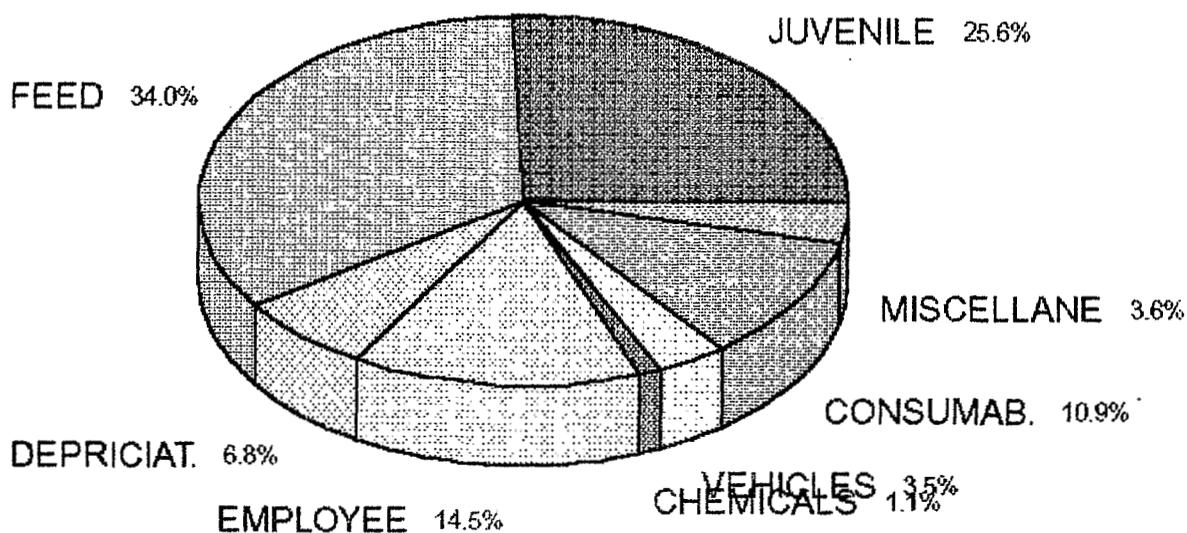


Fig. 4. Expenses of production.

Sales

465,000-FF 15,000 kg Bream x 31 FF (off the cages price)

495,000-FF 15,000 kg Bass x 33 FF (off the cages price)

960,000-FF Sales from production

872,250-FF Production cost

87,750-FF Net profit (Margin % 10.1)

Economic Results

Due to the convenient ecological, natural and climatic conditions of our country as well as cheap labour cost and low energy consumption, production cost of our fish is cheaper than the other countries. Also aforementioned conditions give an advantage of high growth rate and early harvest in Turkey. Thus we can get higher prices from the European market till the other countries start harvesting fish in mid summer.

But the prices start to decrease and the market becomes unstable. Subventions of the EEC and the governments also reduce our chance of competing.

Quality of the feed and juveniles are not sufficiently improved yet and this situation sometimes causes some mortality and slow growth. New studies are continuing to improve the standard and quality.

Pathologic diseases can be effective in particular periods of the production period ut does mostly not cause high mortality when the chemical treatment is applied and stock density is reduced. These periodic sempthoms are mostly vibrio, mixobacteria and so on.