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**UMFT**  
Universitatea de  
Medicină și Farmacie  
„Victor Babeș”  
din Timișoara



“OSH+ for the European Agriculture sector - Stimulating growth in rural areas through capacity building for providers (and beneficiaries) of occupational medicine and OSH services” – AGROSH+

# Trout Farm – Case Study

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# Introduction

- Romania's market in terms of fish farming is at a constant growth over the last decade. There is also a growing need for naturally bred and reared fish, as well as fed with ecological nourishment.
- The case study chosen to be analyzed in terms of health and safety legislation and risk assessment procedure consists of 2 types of jobs in a fish farm (trout breeding): material handler (forklift driver) and farmer (fish breeder).
- There are four natural water springs in the farm's premises, which supply water at constant temperature, with natural nutrients. The water is driven into the water reservoirs via pipes, and is continuously treated against microorganisms with an online UV-lamp.



# Company Data

Name of the company	PASTRAVARIA ***, ***, ROMANIA
Type of the company (LLC, etc.)	Limited Liability Company
Is the company a branch of a larger corporation	Not a corporation. Family owned business (1 location) with 2 associates upgraded with EU funds.
Address of the company	No. 98 ***, ***, Romania
Types of accreditations & certifications the company has (ISO for Quality, for OSH, for Environment, others)	HACCP ISO 22000:2005 (IFS-HPC)



# Company Data



# Human Resources Data

<b>Total number of employees</b>	<b>29</b>	<b>Personnel:</b>  <b>Administrator (owner) – Q</b> <b>Business Development Manager – Q</b> <b>Sales Manager – Q</b> <b>Quality Personnel – Q</b> <b>Production Personnel – NQ</b> <b>Maintenance Technicians – Q</b> <b>Forklift Drivers – Q</b> <b>*Q – Qualified</b> <b>NQ – Non-qualified</b>
<b>Breakdown of employees per age / Less than 18 / 18-55 / older than 55</b>	0(0%) / 26(89%) / 3(11%)	
<b>Breakdown of employees per gender / Male-Female</b>	56% male / 44% female employees	
<b>Other relevant Human Resources related data: number of employees with disabilities, number of employees known to be suffering of chronic diseases &amp; taking daily medication, etc.</b>	<b>0</b> employees with disabilities  <b>Few employees with chronic diseases</b> (allergies – no data, not relevant)	

# Human Resources Data

Working time / Night shifts / Irregular work (seasonal work, temporary workers for some peculiar operations like in vineyards, etc.) **3 shifts** production (3x8h/day, 5 days/week)  
**4 shifts** supervision (3x8h/day, 7 days/week)

Night shifts, weekend shifts, bank holidays shifts, continuous process.

<b>Educational/professional/cultural level of employees</b>	Medium to high educated employees (most of them with professional high-school, management team with higher education and qualified workers in quality department, forklift drivers and technicians)
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# Economic Sector

Economic sector and sub-sector in which the company is working / Agriculture / Any of the following subsectors (Aquaculture, Beekeeping – apiculture, Mollusk farming, Pisciculture (fish farming), Sericulture, Animal husbandry – Aviculture (poultry farming), Animal husbandry – Cattle, Animal husbandry – Sheep farming, Animal husbandry – pig farming, Horticulture, Forestry (Silviculture)

CAEN 0322 – Aquaculture in fresh water

- Breeding and rearing of fish, including ornamental fish
- Activities which involve the use of spawn (caviar)

NACE codes held by the company

A3.2.2 – Freshwater aquaculture

C10.2.0 – Processing and preserving of fish, crustaceans and mollusks

G46.3.8 – Wholesale of other food, including fish, crustaceans and mollusks



# OSH Info

<b>Number of work-related accidents (LTI = Lost Time Injuries) / Number of fatalities / Number of First Aid Cases / Number of near misses</b>	<b>No fatalities/accidents (LTI)/injuries at work</b>  <b>No first aid events</b>  <b>Near misses and other incidents (which didn't result in harm or damage) are not documented, but solved on the spot.</b>
<b>How are the occupational medicine services managed (provide details: is it an independent office of occupational medicine, a clinic, a large provider of occupational medicine services, etc.)</b>	<b>Contract with local clinic (private) which performs legal occupational medical examinations to all employees.</b>
<b>Is there medical staff (doctor or nurse or hygienist) on the company premises / Is there a medical office on the company premises / Are there First Aid boxes on the company premises</b>	<b>No medical staff.</b>  <b>First aid kits throughout the farm and a team of 4 first aiders.</b>



# OSH Info

## Preventive program:

- Regularly updating standard operating procedures, risk assessments, preventive and protective plan.
- Managing changes and obtaining all necessary approvals
- Updating PPE registry
- Regularly updating warning signs
- Regularly replacing used PPE or when necessary.

OSH preventive program targets whole company.

General objective, target and plan of the OSH preventive program are to register 0 accidents at Work Inspectorate (0 accidents resulting in more than 3 days of work lost time).

Result from 2015 to present: zero work related accidents.

## Specific activities:

- Evacuation drills and emergency scenarios, first aid trainings performed once every 2 years.
- 100% all employees to be retrained in terms of OSH every year.



# Production Process

- There are two types of shifts working in the trout farm: 3 shift and 4 shift schedules. The 3 shift schedule is dedicated to normal production (professions: farmer, forklift driver, quality operator, offline/support personnel), while the 4 shift schedule is in place for supervision (profession: farmer, activities during the 4<sup>th</sup> shift: feeding, cleaning, checking temperature, etc.).
- Activities in the trout farm are performed indoors as well as outdoors. Farmer's and forklift driver's activities happen in both conditions, while the support departments together with Quality work mainly indoors.
- The activities that are subject to outdoor activities are exposed to extreme weather conditions during peak temperature seasons (i.e. hot summer, or very cold winter).
- There is an HVAC system that controls the environment in the hall (temperature, humidity, fresh air), and keeps a constant temperature of around 22°C.



# Production Process

- Special spawn is bought from Denmark (they come refrigerated in small boxes) and they are placed in trays, in the so-called “maternity”. The spawn is manually handled on pallets by farmers, who use manual lifting devices.
- Fresh treated water is poured into the maternity by opening a central tap; water goes through a high frequency UV-lamp.
- Each tray can breed up to 10 000 spawn eggs.
- Spawn hatches for 1-2 months before they become “baby trout”.
- Production is supervised and quality checked even from spawn process step.



# Production Process

- Quality checks in this phase require quality operators to manually take water sample using a sterile 250 ml container and then it is introduced in a biosensor meter. The water sample stays for 48 hours and the level of microorganisms is supervised (if the level rises, the water is not prepared to “hatch” spawn).
- When water samples are negative for microorganisms levels, spawn is slowly introduced into the water by farmers.
- Water has a constant temperature of 22°C. Temperature and conductivity are permanently supervised electronically, using sensors.



# Production Process

- Each tray is regularly checked for quality issues, presence of bacteria, viruses, until they “mature”.
- The method to check for bacteria or viruses consists of taking water samples and introducing in it a chemical reactive named m-coliblue24, which will detect the presence of bacteria. This test is also performed by quality department.
- This testing method is different because spawn is already added into the water and the biosensor cannot detect the presence of bacteria/viruses in the spawn.



# Production Process



# Production Process

- After the baby trout leaves the yolk sac, it is transferred to an intermediate water tank hall, where the fish start to grow – the farmers use hand sieve to pick up baby trout and place them into intermediate water pools (indoor).
- They are fed ecological nourishment each hour, they swim on their free will and grow for up to a year – feeding is not automated everywhere, farmers throw twice a day nutrition using a trolley and a bucket.



# Production Process



- The oxygen tank is placed outside and is replaced regularly by a farmer.

- One of the indoor tanks has semi-automated feeding system which consists of a small electric trolley which is driven by a farmer and throws at a constant flow food on the edge of the tank.
- These indoor water tanks are static and they have automatic reoxygenation machine, controlled by a central panel. Hoses are inserted into the water down to the tank's bed and oxygen is introduced in different concentration, depending on the age of the fish.

# Production Process



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# Production Process

- The food is kept in a refrigerated room with controlled climate conditions (temperature, humidity, bacteria etc.), with HEPA filter ventilation. The refrigerators are kept closed with only few qualified employees to use them.



# Production Process

- When they mature to 1.5 years they are transferred to outer pools which imitate their natural ecosystem. The fish are taken with a sieve, placed in a plastic container and released in the outer pools. This activity is performed manually.
- Each sub-pool is build in a vortex style, water has a flowing direction and the velocity and dimensions of the vortex is proportional with the age of the fish.



# Production Process

- When they mature to around 2 years, they are collected, and sacrificed in a 1 cubic meter bin, with water under electric current.
- In under a minute they are ready to be sent to the next process steps. They are placed from the bin into transport trolleys, they are covered with ice and salt and then they reach the production area.



# Production Process



# Production Process

- Before they are sent to packaging, they are “quality checked”, the health of the fish is analyzed as well as the presence of diseases or other viruses.
- The quality laboratory uses chemical reactivities to test the presence of bacteria or viruses inside fish (dust reacts in contact with wet fish skin and provides a color in response). If the test is positive, the production is blocked and the fish is sent to an external laboratory. Together with this test, water samples are also taken and analyzed.



# Production Process

- Quality department has a dedicated laboratory where they test the product (fish) for biological contaminants, as well as water taken from inner and outer pools. The laboratory is equipped with vented reactive cabinet, hoods with HEPA filters, equipment used to test different quality characteristics (rheometer, pH meter, aeration device, vacuum tester).
- They also check the raw and packaging materials that enter the farm (visual).



# Production Process



# Production Process

- The packaging process is semi-automated (preparing fish to be packed is mainly manually done).
- Scales removal is done using a machine that is fed manually with one piece at a time.
- There are 4 types of product that the farm can sell: gutted, boneless, fillet, smoked trout.
- There are 2 types of packaging: vacuumed bag or air controlled box.



# Production Process



# Production Process



- The fish are cut with automatic cutters (company patents) and then they are sent (manually) to vacuums or case packers (company patents).
- They are regularly checked for quality issues, together with their packaging materials (for example, vacuumed bags are tested for pressure resistance, presence of correct label, expiry date etc. – visual activity).

# Production Process



# Production Process



# Production Process



Questions?