

Exam Live Food Production

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Name :

General questions

1. San Francisco Bay (SFB) Artemia and Great Salt Lake (GSL) Artemia are both the same species. Which one ?

Nevertheless, they have quite different characteristics (that are important for aquaculture). Name a few of these differences.

(max. 10 lines)

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2. Cyst processing includes a number of basic actions/operations aiming to get a nice commercial product that can be stored for a long time. What are these actions/operations?

(max. 15 lines)

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Explain (3 lines MAXIMUM !)

1. Artemia is a non-selective filter-feeder

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2. ParthenogeneticArtemia

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3. What is an Artemia STRAIN

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4. Artemiafranciscana

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5. Probiotics

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6. Brachionusplicatilis

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7. S, L, SS type rotifers

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8. Bio-encapsulation

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9. Bürker chamber

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10. Human impact on Artemiaworld distribution

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11. Rotifer batch culture

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12. Redfield ratio

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13. Heterotrophic algal growth

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14. Walne medium

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15. Photobioreactor

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16. DHA

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17. Crystallizer pond

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18. Artemia umbrella

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19. Artemia hatching rate

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20. Green water technique

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Multiple choice

1. 'Hatching percentage' means

- Number of nauplii hatching out of 100 g of cysts
- Number of nauplii hatching out of 100 full cysts
- Number of nauplii hatching out of 1 g of full cysts

2. Cyst size has an effect on hatching efficiency

- Yes because bigger cysts hatch better
- Yes because if cysts are small, there are more of them in a gram (as compared with big cysts)
- No it is the opposite: hatching efficiency has an effect on cyst size

3. For Artemia cyst decapsulation we use two chemicals: NaOCl and NaOH

- The NaOH is doing the decapsulation. We add NaOCl to lower the pH; decapsulation goes better at low pH

NaOCl and NaOH together form Na_2HClO_2 and this molecule is doing the decapsulation

The NaOCl is doing the decapsulation and we add NaOH because it increases the pH. Decapsulation goes better at high pH

4. Which sentence is correct ?

Some Artemia strains produce only nauplii, other strains produce only cysts

The same female sometimes produces broods as cysts, sometimes broods as nauplii, depending on the conditions

A female can produce broods which consists of cysts and nauplii mixed together

5. Parthenogenesis sometimes occurs in invertebrates. In some organisms it is cyclic, in others it is obligate. It is cyclic in the following organisms:

Rotifers and Daphnia

Artemia and rotifers

Daphnia and Artemia

6. Vinh Chau Artemia is originally

San Francisco Bay type

Great Salt Lake type

Bohai Bay (China) type

7. Is Artemia cyst metabolism affected by the water content of the cyst ?

No; Artemia cyst metabolism is only affected by the temperature of storage

Yes, the metabolism is highest in the range 50-60 % water content, and it is lowest below and above this range

Yes, because the higher the water content in the cyst, the higher its metabolism

8. Great Salt Lake Artemia

always have high HUFA contents

always have low HUFA contents

have high or low HUFA contents, depending on the year of harvest

9. Rotifers have some disadvantages, for example:

- long-term culture is difficult because water conditions get bad and contamination with e.g. ciliates occurs
- they can not be enriched, so that their nutritional content can't be improved
- they reproduce slowly, so that long culture periods are needed to get sufficient numbers of rotifers

10. Great Salt Lake (GSL) can produce enough cysts (in productive years) to satisfy the need of the entire world's aquaculture market. Still other resources are exploited. Why?

- because GSL Artemia is not the smallest type of nauplii, and needs to be enriched
- because the productivity of the lake fluctuates from year to year
- because people don't always have money to buy (expensive) cysts on the world market, and the world market is dominated by GSL cysts
- because all of the reasons above

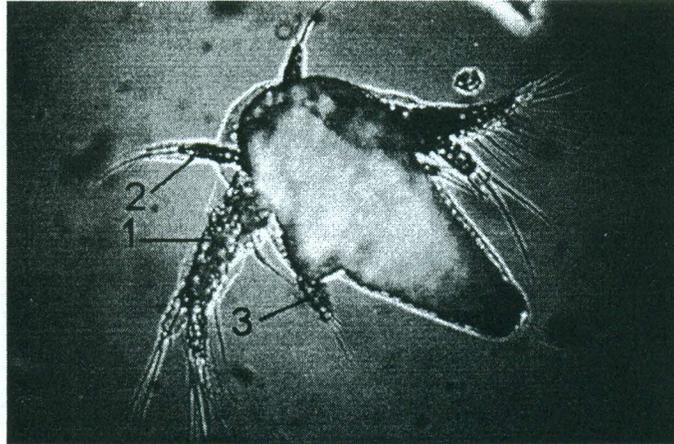
11. These people are working in an Artemia pond. What are they doing?



- they are collecting the big algae, and re-suspending bottom particles ('raking')
- they are collecting cysts with a rake

O they are making the dikes higher with a rake

12. The following picture shows an:

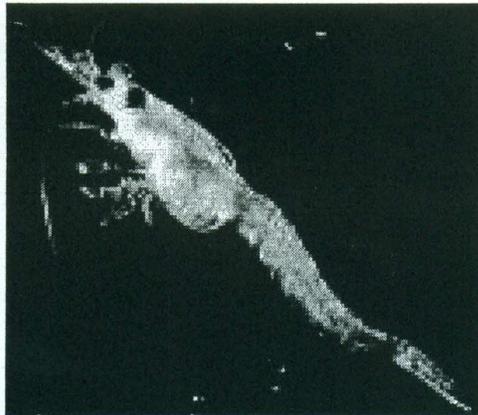


O Artemia instar II metanauplius

O A Triops adult (a very common copepod)

O Artemia instar I nauplius

13. The following sentence is correct:



O left is Panagrellus, and right a cladoceran

O left is a copepod, and right Tubifex

O left is a cladoceran, and right a mysid

14. The following sentence is correct:

- The growth rate of microalgae is determined by the species and various culture conditions, such as light irradiance, temperature....
- The growth rate of microalgae is determined by the species
- The growth rate of microalgae is determined by culture conditions such as light irradiance, temperature....

15. The following sentence about pigments in microalgae is correct:

- Only green microalgae contain the green pigment chlorophyll, only gold algae contain the yellow pigments carotenoids, and only red and blue-green algae contain the red and blue phycobilins
- All microalgae contain chlorophyll
- All microalgae contain chlorophyll, carotenoids and phycobilins

16. The following sentence is correct:

- For most marine fish and shrimp larvae, HUFA's are essential, this means that they need to be given through the food
- For most fish and shrimp larvae, HUFA's are essential, this means that they need to be given through the food
- For most freshwater fish and shrimp larvae, HUFA's are essential, this means that they are important for them

17. Very young marine fish larvae do not have all digestive enzymes at the moment when their yolk sac is completely absorbed. So:

- they should only get an artificial food containing things that they can digest
- they use the enzymes that are present in the live food that is given to them
- they can only be given food when they are able to produce all these digestive enzymes

18. What kind of fertilizers are normally used in *Artemia* culture?

- Only inorganic fertilizers
- Both inorganic and organic fertilizers
- Only organic fertilizers
- You shouldn't use fertilizers because their decomposition creates a bad environment for the *Artemia*

19. A complete integrated salt- *Artemia* culture system includes

- Reservoirs, fertilization ponds and *Artemia* production ponds
- Salt production ponds and *Artemia* ponds
- Reservoirs, fertilization ponds, *Artemia* production ponds, evaporator ponds and crystallizer ponds

20. Which sentence is correct?

- The smallest type of *Artemia* nauplius is bigger than the biggest *Brachionus plicatilis* type, used in aquaculture
- The smallest type of *Artemia* nauplius is about the same size as the biggest *Brachionus plicatilis* type, used in aquaculture
- The biggest *Brachionus plicatilis* type, used in aquaculture, is bigger than the smallest type of *Artemia* nauplius