

# Twin Falls County

University of Idaho, U.S. Department of Agriculture, and Idaho counties cooperating.

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## Probiotics to Control Disease in Aquaculture

Gary Fornshell, Extension Educator

Probiotics are generally defined as bacteria that promote the health of other organisms. Specifically, probiotics are live microorganisms, which when consumed in adequate amounts provide a health benefit for the host.

Probiotics have been used to promote the health of humans and terrestrial livestock for a considerable period of time. Probiotics are available in foods and dietary supplements. Yogurt, fermented and unfermented milk, miso, and soy beverages are examples of foods that contain probiotics.

The use of probiotics in aquaculture is relatively new. The first application of probiotics in aquaculture occurred in 1986. Since then, numerous studies have been published on probiotics, especially within the past decade.

Probiotic strains have been shown to inhibit pathogenic bacteria both in vitro and in vivo. Possible mechanisms that explain probiotic

modes of action include the production of inhibitory compounds, competitive exclusion of other bacteria, enhancement of the immune response, improved water quality, source of nutrients, and beneficial effect on digestive processes.

A recent study\* sought to identify bacteria as suitable probiotic candidates with the potential to control or reduce disease caused by *Flavobacterium psychrophilum*, the causative agent of bacterial coldwater disease. This study was supported by the University of Idaho/Washington State University Aquaculture Research Initiative and the McNair Achievement Program and Graduate Assistantship.

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Probiotics for Aquaculture  
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### Upcoming Classes and Workshops

**New Zealand Mud Snail HACCP Training for Fish Hatcheries**  
February 23, 2011, Hagerman

**Pesticide License Training**  
March 7, 2011 (for 3 days)  
Magic Valley Fish & Game Office, Jerome

**Beef Camp for Youth**  
April 23, 2011, Shoshone

**For more information:**  
please call: 208-734-9590

## Probiotics to Control Disease in Aquaculture

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A total of 318 bacterial isolates were collected from the gastrointestinal tracts of rainbow trout. To be considered a suitable probiotic candidate, bacterial isolates must meet several criteria. First, the bacterial isolate must be re-grown from frozen stock. Once it is established that the bacterial isolate can be re-grown, it is screened in vitro for its inhibitory activity against *F. psychrophilum*. Then it must be shown that the bacterial isolate can colonize and survive in the gastrointestinal tract of the host. Finally, the bacterial isolate is tested to determine whether or not it is pathogenic in the host. Out of 318 bacterial isolates, this study identified 16 candidate probiotics, which inhibit the growth of *F. psychrophilum*, can survive the GI tract of rainbow trout, and are not directly pathogenic to the host.

From the 16 isolates, ten of the most promising candidate probiotics were independently mixed with feed and individually administered to rainbow trout pre and post infection with *F. psychrophilum*. Of the ten evaluated, two strains (designated as C6-6 and C6-8) have shown a significant decrease in mortality compared to positive controls. Both are strains of *Enterobacter* species.

Results have been replicated in the lab, and field trials conducted by the Utah Division of Wildlife Resources have consistently shown a 40 to 50% reduction in mortality compared to

control groups. Such results are exciting and clearly demonstrate commercial potential of these bacteria for use as probiotics in aquaculture. The University of Idaho is planning on moving forward to patent both of these bacterial strains.

\*Principal Investigator: Dr. Kenneth Cain, University of Idaho;  
Collaborators: Dr. Scott LaPatra, Clear Springs Foods, Inc., and Gary Fornshell, University of Idaho;  
Support Personnel: David Burbank, Nicole Lindstrom, Timberly Maddox, and Kurt Eversman, University of Idaho.

## Control Bur Buttercup Early

Steve Hines, Extension Educator



It is the middle of January, and the weather can't seem to decide if it is winter or early spring.

This is typical of the Magic Valley during this time of year. While the humans are still trying to stay warm

and make it to the first warm days of spring, the little winter annual weeds are starting to think about breaking dormancy and getting on with the year. While there are several out there, I want to discuss one in particular; Bur Buttercup. Bur Buttercup is a winter annual that emerges, flowers, and sets fruits in the spring, when temperatures climb into the 45-50 degree range. Plants only grow to be 2 or 3 inches tall. They often occur in dense mats, which cover large areas of the ground. Each blossom usually has 5 bright yellow petals. The flowers are very tiny, measuring less than a quarter inch long. At maturity, each blossom develops into a bur  $\frac{1}{2}$  -  $\frac{3}{4}$  inches long, which dries and turns brown.

This tiny weed can cause big problems aesthetically and otherwise. Many people confuse it with puncture vine but it isn't in the same class of nasty as puncture vine, although it is very prolific. Bur Buttercup will germinate, grow, and go to seed long before puncture vine gets going. I am writing about this little weed in January because it will start to grow toward the end of February, and definitely by March. By the time April comes around and normal spring chores start, it is usually too late and this weed has taken over the driveway, barrow ditch, waste areas, equipment yards, roadsides, pasture areas and it can be a problem in grain crops as well.

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UNIVERSITY OF IDAHO EXTENSION UPDATE

## Twin Falls County

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## Control of Bur Buttercup Early

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So, what is it about this little weed that is a problem? For starters, while snow drifts are still melting and the wind is blowing cold, it breaks its winter dormancy and starts growing. Most of us aren't even thinking about spraying or controlling weeds before this one is almost done. By the time you see the tiny yellow flowers and think about spraying it, you are too late. It will go to seed and produce the little bur. This little bur is generally what gets people's attention. While not as harsh as the puncture vine, it will stick to bare feet and can cause a generally unsightly mess in border or waste areas. Bur Buttercup is also poisonous to sheep. It is one of the first plants to green up in the spring, so livestock hungry for fresh green feed may be tempted to eat this weed. Sheep can graze close to the ground and can easily eat this low-growing weed.

Bur Buttercup is easy to control; you just have to get to it before it goes to flower and produces its bur. As an annual weed with a tiny taproot it can be easily tilled, hoed, or raked out of the ground with a stiff garden rake. You can use herbicides such as 2,4-D or glyphosate on

this weed with good success as well. Always read and follow the instructions printed on the pesticide label and use pesticides with care. Do not use a pesticide unless the specific plant, animal, or other application site is specifically listed on the label. Store pesticides in their original containers and keep them out of the reach of children, pets, and livestock. Spraying will usually take place sometime in March, depending on the weather. Herbicides take a much longer time to work when temperatures are below 50 degrees, but they will work. Don't spray if it has frozen in the past 48 hours or will freeze in the next 48 hours. Don't wait for the plants to flower or they will likely produce the bur anyway before they succumb to the herbicide. Start looking for this little weed around the end of February, especially if the weather provides a few warm days.



Bur Buttercup  
Source: Google Images

## Pesticide License Training

Steve Hines, Extension Educator

Anyone needing to apply a restricted-use pesticide must have an Idaho pesticide applicator license. Landowners need a private applicator license, and those applying professionally or for agencies need a professional applicator license. One of the major uses for this license in our area is to obtain Zinc Phosphide bait for control of voles or rock chucks.

University of Idaho Extension is holding a Pesticide License Training in March at the Magic Valley Fish & Game Office, located at 324 S. 417 East, Suite #1 in Jerome. The training is 3 days and will run March 7th, 8th, and 10th from 8 am - 5 pm. The cost for the training is dependent on the type of license - private (\$55) and professional (\$65). There will be an additional cost of \$10 for each test, which will go to the Department of Ag. You will need to contact Steve Hines at the Twin Falls County Extension Office to register at least 2 weeks in advance to sign up and order training materials. Materials will be an additional cost, which will depend on the individual's needs. For more information, you can reach Steve at (208) 734-9590, ext 19 or email him at [shines@uidaho.edu](mailto:shines@uidaho.edu).



Pesticide Sprayer  
Image Resource: Bing

# Nutrition Tip — Healthy Eating for a Healthy Weight

Cammie Jayo, Coordinator Extension Nutrition Program (ENP)

A healthy lifestyle involves many choices. Among them, choosing a balanced diet or eating plan. So, how do you choose a healthy eating plan? Let's begin by defining what a healthy eating plan is. According to the *Dietary Guidelines for Americans*, a healthy eating plan:

- Emphasizes fruits, vegetables, whole grains, and fat-free or low-fat milk and milk products
- Includes lean meats, poultry, fish, beans, eggs, and nuts
- Is low in saturated fats, *trans* fats, cholesterol, salt (sodium), and added sugars
- Stays within your daily calorie needs

A healthy eating plan that helps you manage your weight includes a variety of foods you may not have considered. If "healthy eating" makes you think about the foods you **can't** have, try refocusing on all the new foods you **can** eat —

- **Fresh fruits** — don't think just apples or bananas. These are great choices, but try some "exotic" fruits, too. How about a mango? Or a juicy pineapple or kiwi fruit! When your favorite fresh fruits aren't in season, try a frozen, canned, or dried variety of a fresh fruit you enjoy. One caution about canned fruits is that they may contain added sugars or syrups. Be sure and choose canned varieties of fruit packed in water or in their own juice.
- **Fresh vegetables** — try

something new. You may find that you love grilled vegetables or steamed vegetables with an herb you haven't tried, like rosemary. You can sauté vegetables in a non-stick pan with a small amount of cooking spray. Or, try frozen or canned vegetables for a quick side dish — just microwave and serve. When trying canned vegetables, look for vegetables without added salt, butter, or cream sauces. Commit to going to the produce department and trying a new vegetable each week.

- **Calcium-rich foods** — you may automatically think of a glass of low-fat or fat-free milk when someone says "eat more dairy products." But what about low-fat and fat-free yogurts without added sugars? These come in a wide variety of flavors and can be a great dessert substitute for those with a sweet tooth.
- **A new twist on an old favorite** — if your favorite recipe calls for frying fish or breaded chicken, try healthier variations using baking or grilling. Maybe even try a recipe that uses dry beans in place of higher-fat meats. Ask around or search the internet and magazines for recipes with fewer calories — you might be surprised to find you have a new favorite dish!

The MyPyramid.gov website has an eating plan based upon the approximate number of calories your body needs according to your age, sex, height, weight, and activity level. The plan gives you the

amounts of foods from the various food groups you should eat each day to meet that calorie goal.

What about eating some of your favorite comfort foods? Healthy eating is all about balance. You can enjoy your favorite foods even if they are high in calories, fat or added sugars. The key is eating them only **once in a while** and balancing them with healthier foods and more physical activity.

Some general tips to keep in mind when choosing those "extra" foods:

- Consume them less often. If you normally eat these foods every day, cut back to once a week or once a month. You'll be cutting your calories because you're not having that food as often.
- Eat smaller amounts. If your favorite higher-calorie food is an afternoon chocolate bar, have a smaller size or only half a bar. Be careful! This technique works well for some people, but others may find it is too tempting to have their favorite food available, even in smaller amounts.
- Try a lower-calorie version. Use lower-calorie ingredients or prepare it differently. For example, if your macaroni and cheese recipe uses whole milk, butter, and full-fat cheese, then try remaking it with non-fat milk, less butter, light cream cheese, fresh spinach and tomatoes. Just remember to not increase your portion size.

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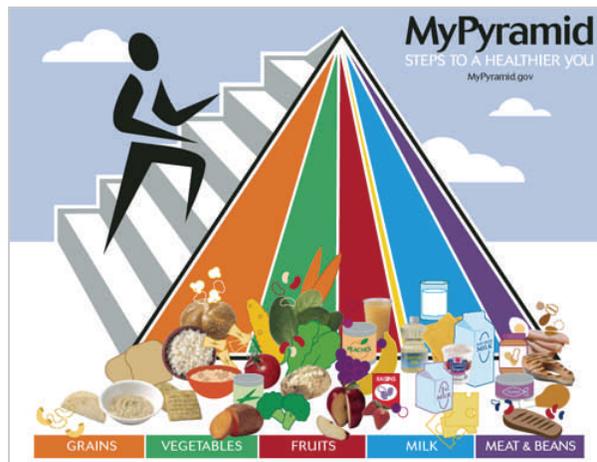
## Nutrition Tip — Healthy Eating for a Healthy Weight

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The point is, you can figure out how to include almost any food in your healthy eating plan in a way that still helps you lose weight or maintain a healthy weight.

Being consistently healthy in your eating choices is the key. Making the same healthy eating choices over time can lead to better eating habits. By thinking more positively and focusing on what you **can** have, you'll help yourself establish healthy eating habits.

To learn more go to:  
[www.Nutrition.gov](http://www.Nutrition.gov)



## Healthy Pasta Tips

Rhea Lanting, Extension Educator

For generations, pasta has been a part of family traditions from weeknight meals to holiday feasts. Busy families continue to search for foods that are healthy, satisfying and economical. Next time, the pasta aisle may be the one you look at.

In response to dietary guidance urging Americans to include more whole grains in their diets, manufacturers have introduced nutritionally enhanced pasta varieties such as whole wheat, whole grain, and pasta fortified with omega-3 fatty acids and additional fiber. Pasta is very low in sodium, and non-egg varieties are cholesterol-free. Per cup, enriched pastas provide an excellent source of folic acid and a good source of other essential nutrients, including iron and several B-vitamins. Also, as a food that has a low glycemic index (GI) - low GI foods are digested more slowly; pasta provides a slow release of energy without spiking blood sugar levels. Remember, a serving size is usually ½ cup for people with diabetes.

Typical pastas are low in fat; most of the calories will come from the carbohydrates. Egg noodles are higher in fat and cholesterol because they are made with eggs. They are also a little higher in calories. Many whole wheat pastas provide 6 grams of fiber, which is

considered an excellent source of fiber. Pasta that has the whole grain stamp provides 34 grams of whole grains, which is close to the 48 grams of whole grains recommended per day.

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## Healthy Pasta Tips

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To prepare the perfect pasta:

1. Boil 4-6 quarts of water for one pound of dry pasta.
2. Add the pasta with a stir and return the water to a boil.
3. Stir the pasta occasionally during cooking.
4. Follow the package directions for cooking times. If the pasta is to be used as part of a dish that requires further cooking, undercook the pasta by 1/3 of the cooking time specified on the package.
5. Taste the pasta to determine if it is done. Perfectly cooked pasta should be "al dente" or firm to the bite, yet cooked through.
6. Drain pasta immediately and follow the rest of the recipe.

To store your pasta:

- Store uncooked, dry pasta in your cupboard for up to one year. Keep in a cool, dry place.
- Refrigerate cooked pasta in an airtight container for 3-5 days. You may add a little oil (1-2 teaspoons for each pound of cooked pasta) to help keep it from sticking. Because cooked pasta will continue to absorb flavors and oils from sauces, store cooked pasta separately from sauce.
- The best pasta shapes for freezing are those that are used in baked recipes, such as lasagna, manicotti or jumbo shells. You will have better results you prepare the recipe and freeze it before baking. To bake, thaw the dish to room temperature, and bake as the recipe directs.

For more information, contact me at 208-734-9590 ext. 21.

## Avoiding Cold Stress on Cattle

Jim Church, Extension Educator, Idaho County

Winter came early this year with our first snow at Thanksgiving, but we are by no means through with it just yet. Cold, wet weather is tough on everyone and everything. It can be especially stressful for cattle. The following information will give some guidelines for what to consider this winter in terms of cold stress on cattle.

## When Do I Need To Be Concerned About Cold Temperatures?

Cattle have a 20 to 30 degree temperature range where feed efficiency and gain are maximized, meaning the energy in the diet can be used for growth while the energy needed for body maintenance is at its lowest point. This temperature range is called the thermoneutral zone (TNZ).

Of course, the TNZ for cattle will vary based on hair coat, summer versus winter, moisture conditions, age and size of cattle, duration of exposure to temperature differences, and wind velocity. If you look at the TNZ of cattle, there is a critical minimum temperature where below this level, they experience cold stress. Table 1 shows the estimated lower critical temperatures for beef cattle. As you can see, hair coat and moisture level play a huge role in temperature stress.

**Table 1.** Estimated Lower Critical Temperatures for Beef Cattle.\*

Coat Description	Critical Temp.
Summer Coat or Wet	60 degrees Fahrenheit
Dry Fall Coat	45 degrees Fahrenheit
Dry Winter Coat	32 degrees Fahrenheit
Dry Heavy Winter Coat	19 degrees Fahrenheit

\*Brownson, R & Ames, D. "Winter Stress in Beef Cattle," Cattle Producer's Library. CL760.

According to this table, when the temperature hits 19 degrees or below, even with a dry heavy winter coat, cattle can experience cold stress, if there is no change in management.

Wind chill is another big contributor to cold stress. Couple this with wind and rain and you have a great combination of factors that add to cold stress.

Table 2 outlines the wind chill index for cattle. I realize that this table is loaded with numbers, but to determine the temperature based on the wind speed, let's do an example.

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## Avoiding Cold Stress on Cattle

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If the temperature is 20 degrees and the wind speed is 10 mph, the adjusted temperature with the wind chill is 8 degrees. If your cattle have a dry heavy winter coat, the critical minimum temperature is 19 degrees; therefore, the cattle are being stressed by the cold temperatures and management steps should be taken to reduce this stress.

**Table 2.** Wind-chill Values for Cattle.\*

Wind (mph)	Temperature (Fahrenheit)						
	-10	-5	0	5	10	15	20
0	-10	-5	0	5	10	15	20
5	-16	-11	-6	-1	3	8	13
10	-21	-16	-11	-6	-1	3	8
15	-25	-20	-15	-10	-5	0	4
20	-30	-25	-20	-15	-10	-5	0
25	-37	-32	-27	-22	-17	-12	-7
30	-46	-41	-36	-31	-26	-21	-16

### What Effect Does Cold Stress Have on Cattle?

Cold temperatures increase the demand for energy in the cow's diet. Table 3 outlines the effect of cold temperatures on energy and intake requirements.

**Table 3.** Effect of Temperature on Energy Needs (Dry Winter Coat).\*

Effective Temperature	Extra TDN Needed	Extra Hay Needed (lbs/cow/day)	Or Extra Grain Needed (lbs/cow/day)
50F	0	0	0
30F	0	0	0
10F	20%	3-4 lbs	2-2.5 lbs
-10F	40%	7-8 lbs	4-6 lbs

\*Boyles, S. & McCutcheon, J. Winter Cold Stress On Cattle. Ohio State University Extension

As you can see, when cattle are cold stressed, they need additional feed and energy in order to generate heat to maintain the correct core body temperature.

As a rule of thumb, for every one degree below the critical minimum temperature, a cow's energy requirement increases by one percent. This means that more feed or a higher quality, more nutrient dense feed is needed. Grain may also need to be added to the diet to meet the increased energy requirements.

For every 1 degree below the TNZ, a cow's energy requirement increases by 1%.

### How Can I Help My Cattle?

Every cattle producer I know tries to provide shelter from the elements when the weather gets really nasty. Many of you already implement management practices that provide comfort for your cattle. So, this may be a review for you, but there may be some new ideas. Below are some suggestions for reducing cold stress in cattle:

1. Provide wind breaks to reduce wind chill.
2. Place feed bunks or round bale feeders on south slopes and in areas where the temperatures are warmer. Avoid draws where cold air settles.
3. When temperatures fall below critical minimum temperatures for cattle, increase the energy in the rations. Also, increase the quantity and if possible the quality of the feed.
4. Provide bedding when temperatures are extremely cold.
5. Shelter doesn't have to be constant, but cattle need relief from wind chill and cold stress. Constant stress is very hard on cattle.
6. Make sure cattle are in good body condition to handle cold stress. It is recommended that cows be in body condition score 5 and heifers a score of 6.
7. Sort cattle by body condition score early in the winter feeding period before cold stress hits. Feed thin cattle to increase condition prior to the severe cold.
8. Cold stress is the most severe when the cow's hide is wet. Plan accordingly.
9. Carefully monitor weather reports and prepare ahead of time for severe weather.

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# Twin Falls County

## Avoiding Cold Stress on Cattle

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### Summary

Cattle are amazingly tough in regard to their ability to withstand the harsh elements. Managing to reduce cold stress will result in more content, stress free cattle that maintain productivity.

Remember, when cattle are stressed, their first response is to stay alive and maintain themselves. Reproduction, growth, and everything else comes to a stop or is reduced greatly. In turn, profits suffer.

I hope this has provided information on the need to monitor cold stress, and that cattle have a TNZ and a minimum critical temperature. Hopefully, the information on how much additional energy and feed is needed will also be of use.

It appears that this winter will be tougher than some in the recent past. Good luck with your winter feeding and with your efforts to reduce cold stress in your cattle.

Please contact me if you have any questions regarding this issue or any other cattle related topic.

### Contact Information:

Jim Church, 320 West Main, Grangeville, Idaho 83530;  
email: [jchurch@uidaho.edu](mailto:jchurch@uidaho.edu); phone: 208-983-2667.

### References:

Brownson, R. and Ames, D. Winter Stress in Beef Cattle. Cattle Producer's Library. CL760.

Boyles, S. and McCutcheon, J. Winter Cold Stress on Cattle. Ohio State University Extension.



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