

OAKLAND CUSD #5

AG SCIENCE
APRIL 20-24, 2020

JEFF COON

Week of April 20-24, 2020

All of these assignments are on google classroom. You must pick one of the 3 listed and complete by next Monday April 20 for credit. If you would like to use google docs to complete the work that would be most efficient, just remember to start a new copy with your own work please. Paper copies can be returned to the school.

Class	Choice 1	Choice 2	Choice 3 (Enrichment)
Ag Science	Common Breeding	Starting an sae	FFA Official dress
Ag Business Mang	MaInvestments	Life Insurance	Business Plan
BSAA	Advanced DNA	Animal Repro Systems	Domestic Animals
Landscape Design	Environment	Landscape tools	Landscape IPM
Intro To Ag	FFA Creed	Parly pro	World food supply
Ag Mech.	Profile Leveling	Power tools	Precision Ag

Mr. Coon Ag Science

Common Breeding Set up

April 20-24

Checking Your Knowledge:

1. What is straightbreeding?

2. What is crossbreeding?

3. What are the advantages and disadvantages of inbreeding?

4. What is the most risky of the inbreeding systems? Why?

Common Breeding Systems for Livestock Production

EVERY ANIMAL PRODUCER uses some type of breeding system to produce new offspring. A variety of systems can be used depending on the production goals of the operation. Some producers sell their offspring into specialty markets where they must be bred in a special way. Others sell their offspring to be marketed as replacement animals for other breeders. These animals must have superior genetics to aid in the purchaser's herd improvement.



A producer must be careful when selecting a breeding system. A breeding system can cause a rapid improvement within a group of animals or wreck a production system.

Objective:



List and explain common breeding systems used in livestock production.

Key Terms:



closebreeding
crossbreeding
grade animal
grading up
heterosis

hybrid
hybrid vigor
inbreeding
linebreeding
outcrossing

purebreds
purebreeding
straightbreeding

Animal Breeding Systems

Animal producers determine how to breed their animals depending on the goals of their operation. They select the breeding system that most closely meets the requirements of the market into which they sell their animals. Breeding systems can be divided into two basic groups: straightbreeding and crossbreeding. **Straightbreeding** is the mating of animals of the same breed. **Crossbreeding** is the mating of animals of different breeds. When producers use straightbreeding, their animals typically have registration papers issued by a national breed organization. When producers use crossbreeding, they typically have animals that are a combination of breeds, or they use two different breeds to create offspring that are not registered as a recognized breed.

A crossbreeding producer may have crossbred females but utilize a male from one breed, or vice versa. An offspring born to a mating of two different breeds is called a **hybrid**. The advantages of producing hybrids are that they typically grow faster, mature quicker, and utilize the superior traits of each breed.

These advantages are referred to as **hybrid vigor** or **heterosis**.

The offspring from crossbreeding contain the genetics from both breeds and, when paired, typically produce superior animals or unique traits. Crossbreeding of dogs has become popular in recent years. New crosses, such as Labradoodles and pugles, have been developed. A Labradoodle is the cross of a Labrador retriever and a poodle. A pugle is the cross of a pug and a beagle. These crossbreeds have created characteristics that dog owners desire and resulted in elevated puppy prices.

Straightline breeding operations utilize only one breed. A traditional straightline breeding program is called purebreeding.

Purebreeding is the mating of two animals registered to the same breed organization. The animals are called purebreds. **Pure-**



FIGURE 1. These crossbred cows most likely have high milk production and superior growth genetics that are passed to their offspring. (Courtesy, USDA)



FIGURE 2. The dairy cow in the foreground is registered to the American Holstein Association, making her a purebred cow. (Courtesy, USDA)

purebreds are animals with extensive pedigrees that can be traced back through one breed. Purebreds are typically marketed to other purebred breeders who want to introduce new genetics or to crossbreeders who want to utilize heterosis. Purebreds normally bring a premium for their offspring because of their superior genetics and tracked background. The utilization of straightline breeding and crossbreeding can be broken down further into subcategories.

The mating of an animal to a related animal is called **inbreeding**. Inbreeding has its advantages and disadvantages. The two parents have closely related genetics and may capitalize on their superior traits. For example, a producer might try inbreeding to increase milk production. In this situation, the producer might mate his or her best-producing cow to a bull that happens to be a relative of the cow and that also has high milk production genetics. In theory, this may seem like a brilliant idea, but if the milk production trait is not expressed by the offspring, the results would be a failure.

The amount of inbreeding determines how closely the animals are related. A producer who practices **linebreeding** is intentionally mating animals that are distantly related. The animals might be distant cousins or share a relative three or four generations back. The process is called linebreeding because if you were to draw a straight line from the original relative, both would be linked to the line.

Another example of intensive inbreeding is called closebreeding. **Closebreeding** is the most intensive form of inbreeding because the two animals share more than one close relative. This could include mating half brothers and half sisters or even brothers and sisters. It is the most risky of the inbreeding systems. Inferior genetics and even deformities can be expressed by using the closebreeding system.

Other subcategories of crossbreeding and straightbreeding are called outcrossing and grading up. **Outcrossing** is the mating of animals of different families within the same breed. The animals are not related. **Grading up** is the mating of a purebred male to a grade female. A **grade animal** is any animal not eligible for registration but of high genetic caliber. An example would be a purebred animal without registration papers. Outcrossing allows a producer to introduce new genetics while staying within the same breed. The new genetics may bring a superior trait to fix a problem within the producer's foundation animals. Grading up allows producers still to raise superior animals without the investment in purebred animals. This is most common in food production animals, where a producer wants superior offspring but cannot make a profit by using the purebreeding system.

Summary:



An animal breeder must pick the breeding system that best fits the goals of his or her operation. This is determined by how the producer plans to market the offspring and how much risk the producer is willing to take in possibly dealing with inferior genetics. Typically a producer uses either the straightbreeding or crossbreeding system. This can be further refined by using the inbreeding, linebreeding, closebreeding, outcrossing, and grading-up subcategories. Each has its advantages and disadvantages but may improve a group of animals.

Checking Your Knowledge:



1. What is straightbreeding?
2. What is crossbreeding?
3. What are the advantages and disadvantages of inbreeding?
4. What is the most risky of the inbreeding systems? Why?

Expanding Your Knowledge:



Go online and further research the possible results of inbreeding animals. Identify five advantages and five disadvantages of using this breeding system. You may also use other resources, such as textbooks and research journals. Ideally, you will determine whether the risks of inbreeding outweigh the rewards.

Web Links:



Purebred Beef Cattle Associations

<http://www.cattletoday.com/associations.shtml>

Crossbreeding Dairy Cattle

<http://www.traill.uiuc.edu/dairynet/paperDisplay.cfm?ContentID=373>

American Mixed Breed Obedience Registration

<http://www.amborusa.org/>

Agricultural Career Profiles

<http://www.mycart.com/career-profiles>

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Ag Science

Starting an SAE

April 20 - 24

Checking Your Knowledge:

1. What should be included in a business agreement?

2. What does the acronym S.M.A.R.T. stand for?

3. How can you calculate whether your business will experience a profit or a loss?

4. How do you calculate net worth?

5. What is the difference between cash and non-cash receipts and expenses?

Getting Started with Your SAE Program

WHEN PLANNING your SAE program, it is hard to know where to start. You may ask the following questions: Where can I keep my records? How much should I charge for my service? What products can I sell? What is my end goal? These questions can be overwhelming when you are starting your SAE, but their answers can be determined by putting your ideas on paper.



Objective:



Determine the planning tools needed to begin a supervised agricultural experience (SAE) program.

Key Terms:



asset	expense	profit
budget	liability	receipt
business agreement	loss	training agreement
cash expenses	net worth	training plan
cash receipts	non-cash expenses	
collateral	non-cash receipts	

Understanding an SAE Program

It is difficult to know where to start when you are just beginning your supervised agricultural experience (SAE) program. Your mind is racing with questions that seem to be too complicated to answer. Work with your parents, agriculture teacher, and possible employers to start answering those questions. Start your SAE with a plan and reasonable goals.

PLANNING YOUR SUPERVISED AGRICULTURAL EXPERIENCE PROGRAM

When beginning to plan an SAE, develop a business agreement, set goals, and—if it is a placement SAE—develop a training plan and agreement with your employer.

Considerations of a Business Agreement

A **business agreement** is a document developed by the student, their parents/caregiver, teacher, and employer stating the financial agreements and plans for the SAE program. The first item to consider is the dates for which the agreement is valid. It tells you and anyone else involved in the SAE how long you are agreeing to work. The business agreement also outlines how the income and expenses from the project are handled, and this sets the tone for the potential financial growth from the project.

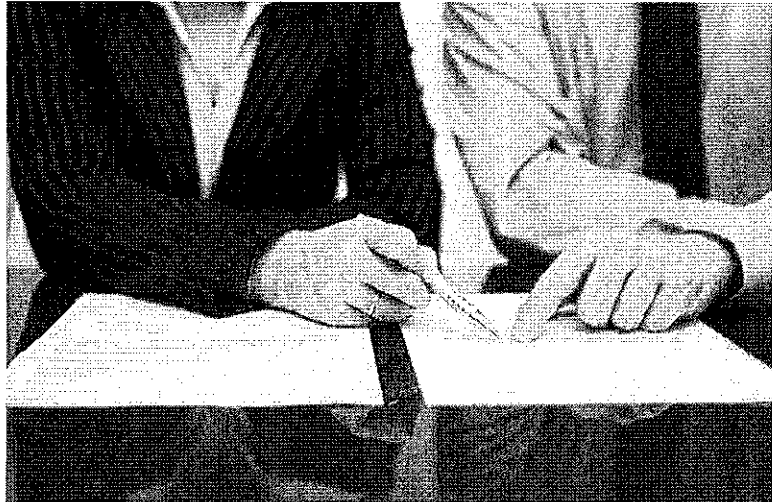


FIGURE 1. A business agreement outlines the financial plans of the business.

Income

A business agreement states who will receive the income from the business products, showing products in competitions, and any labor. If your SAE project is raising crops or animals, you have the opportunity to show these animals at the county and state fairs throughout the year. You may have income from selling an animal or product. All sources of potential income should be considered in the business agreement. If you are simply working for a business, your source of income likely will be only the wages that you earn.

Responsible Parties

A business agreement explains who is responsible for the business expenses, such as supplies, feed, and veterinary bills. When you show animals or crops at a fair, you may have to pay for exhibiting fees. If you run a business based in mechanics (e.g., custom baling), you may have machinery, equipment, and building investments as well as upkeep expenses to consider. When your business grows to the point where you must hire someone to help you perform the work, you have labor expenses. Also, many miscellaneous expenses may occur with your specific SAE program.



ON THE JOB...

CAREER CONNECTION: Feed Sales Representative

A feed sales representative is a person who travels to the livestock farms and markets feed to farmers and ranchers. He or she knows the important aspects of the feed (e.g., protein and mineral content, ingredients, and ways the feed can advance livestock growth). The farmer wants to know why this particular feed is better than what he or she is currently using, and it is the feed sales representative's job to explain.

To become a feed sales representative, you must obtain your bachelor's degree in agribusiness or animal sciences, with a business minor. The typical annual salary range is between \$42,000 and \$65,000. By starting your SAE at a veterinary office or an agricultural supply store, you are already gaining some experience that will help you grow into this career. Ask your agriculture teacher about other agricultural careers related to your SAE program.



A feed salesperson is working with a farmer to determine the best feed for beef cattle.

Signatures

Lastly, the business agreement should be signed when all parties involved agree upon the responsibilities. This is important because it shows that you and your employer are in agreement with the wage paid and how the income and expenses will be handled.

S.M.A.R.T. Goals

Setting goals is one of the first steps in planning any successful business. Goals should be created using the S.M.A.R.T. acronym to set realistic goals for your SAE and to stay focused on what you need to do to be successful. SMART means:

- ◆ S—Specific
- ◆ M—Measurable
- ◆ A—Achievable
- ◆ R—Realistic or focused
- ◆ T—Timely

Training Agreement

A training agreement and training plan are only used in a placement SAE, when you are working for an employer. A **training agreement** is something that explains your training

that will take place during the SAE program. The document makes the SAE official between you and your employer. A training agreement describes the SAE program conditions, determines the pay rate, and explains the expectations of all parties involved. Signatures are required of you and your teacher, parents, and employer. Signing the training agreement shows everyone is in agreement with the training and wage that will be carried out during the SAE project.

Training Plan

A **training plan** is a form that lists the experiences to be gained through the SAE program. It lists the dates each training item is to be accomplished, indicates when training will begin and end, and provides the name of the business in which training will be carried out.

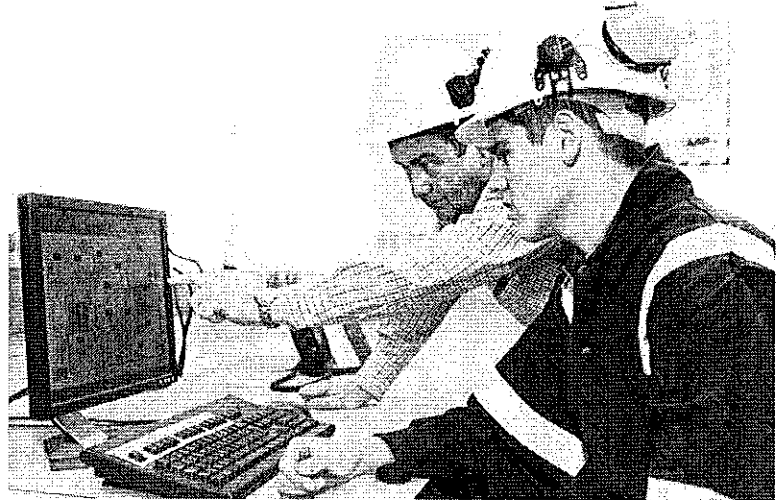


FIGURE 2. A student worker is being trained on how to use the CAD program to plan an agricultural fuel tank and transportation system.

BUGETING FOR SUCCESS

A **budget** is a record of anticipated expenses and income for an SAE program. It will show the estimated profit or loss for the program. A budget should be created at the beginning of each record year. It should include income from wages earned, products sold, ending inventory, show premiums, and any other source of income to the SAE program.

Estimated expenses are included in the budget. Examples of expenses that should be considered for the budget are products in the beginning inventory, products to be purchased, and any fixed or operating expenses that the SAE program might acquire.

Profit is the amount of income remaining after all expenses are paid. To determine profit, subtract the total expenses acquired by the business from the total income. A **loss** is a situation that occurs if the total business expenses are greater than the total income. When a loss occurs, the business suffers.

CALCULATING NET WORTH

Net worth is a person's worth financially. It is calculated by taking a person's total assets and subtracting the liabilities. An **asset** is something owned by a person. In contrast, a **liability** is the money a person owes on a debt. Net worth is important when purchasing a home or obtaining a business loan.

The net worth amount allows the bank to calculate how much money to loan a person or business by assessing the ability of the person to repay the loan through assets. **Collateral** is the assets a person owns that are used as leverage to obtain a loan.

CASH & NON-CASH RECEIPTS AND EXPENSES

When starting an SAE program, consider the potential to profit or absorb a loss by creating a budget. For the budget to be realistic, first determine receipts and expenses. A **receipt** is income or a return on an investment. In contrast, an **expense** is money paid for products or services to operate the business. Two types exist of receipts and expenses.

Receipts

There are cash receipts and non-cash receipts.

Cash Receipts

Cash receipts are income from money in the form of coins or dollar bills. This income could be from selling products or services to customers or from cash sales of livestock, crops, or horticultural plants. In addition, it could be from wages earned.

Non-Cash Receipts

Non-cash receipts are business income from inventory or investment gains where no cash is received. An example is a gain on a capital investment or an increase in business inventory.

Expenses

Cash expenses and non-cash expenses must be anticipated.

Cash Expenses

Cash expenses are money paid from the business for the exchange of products or services necessary to operate the business. Some examples of cash expenses are purchasing services (e.g., vet and medical expenses, feed, fertilizer, seed, and advertising).

Non-Cash Expenses

Non-cash expenses are monetary loss from a business without cash being exchanged. Examples are the depreciation of capital inventory and accrued interest on a bank loan.



FIGURE 3. Your net worth is a simple calculation of subtracting your liabilities from your assets. You never want to owe more money than what your assets are worth.

Summary:



For a successful SAE program, create a business agreement that outlines the finances of the SAE program. It must be signed by all parties involved signifying that everyone is in agreement with the business finances. Also, S.M.A.R.T. goals should be written to plan the direction of your SAE program.

The training agreement and training plan outline the training and wage. A training agreement and training plan are only required if you are working for an employer, not if you own your own business. Create a budget for your SAE program. Consider your income and expenses for the SAE program. The budget shows whether or not you can expect to make a profit.

Checking Your Knowledge:



1. What should be included in a business agreement?
2. What does the acronym S.M.A.R.T. stand for?
3. How can you calculate whether your business will experience a profit or a loss?
4. How do you calculate net worth?
5. What is the difference between cash and non-cash receipts and expenses?

Expanding Your Knowledge:



Work with your agriculture teacher and parents to discuss possible SAE programs for you. Set a meeting to draw up a business agreement, training agreement and plan, and a budget for your SAE program. Develop S.M.A.R.T. goals to guide your SAE program.

Web Links:



Supervised Agricultural Experiences

<https://www.ffa.org/about/supervised-agricultural-experiences>

Budget Worksheet

<https://www.bankofamerica.com/deposits/manage/creating-a-budget.go>

Creating a Budget

<http://www.daveramsey.com/media/broadcast/mytinmo/pdf/guide-to-budgeting.pdf>

MyCaert.com Career Profiles

<http://www.mycaert.com/career-profiles/>

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FFA OD

April 20 -24

Checking Your Knowledge:

1. What are the official FFA colors?
2. What are the five symbols on the FFA emblem, and what do they represent?

What else is on the emblem besides the five symbols?

3. What makes up FFA Official Dress for male members?

4. What makes up FFA Official Dress for female members?

5. How are awards and pins properly displayed on the FFA jacket?

FFA Colors, Emblem, and Official Dress

AN ORGANIZATION with a rich heritage, such as the National FFA Organization, usually has many symbolic images and statements that have great meaning to its past, present, and future direction. The FFA colors, emblem, and Official Dress create an image in the minds of members and supporters of what the organization represents.



Objectives:



1. Examine the meanings of the official FFA colors and the meaning of the FFA emblem.
2. Recognize the components of male and female Official Dress.
3. Relate or demonstrate the proper use of the official FFA jacket, and determine the appropriate display of degree, office, and award pins on the jacket.

Key Terms:



corn gold	eagle	owl
cross section of an ear of corn	national blue Official Dress	plow
		rising sun

The Official FFA Colors and Emblem

Behind every organization are colors that represent the ideals of the organization and an emblem that is recognizable by many. The National FFA Organization has two official colors and an emblem.

OFFICIAL FFA COLORS

The official FFA colors were adopted in 1929. They are corn gold and national blue. **Corn gold** is the color that represents the golden fields of ripened corn. **National blue** is the color that represents the blue field of the American flag.

THE FFA EMBLEM

The FFA emblem represents the history, goals, and future of FFA. It is composed of five symbols, along with the term “Agricultural Education” and the name “FFA.”

The first symbol is the cross section of an ear of corn. The **cross section of an ear of corn** is the symbol for unity in the organization. No matter what state you live in, corn is probably grown somewhere in that state. Corn is the most widely grown agricultural crop in the nation and serves as the backbone of the FFA emblem.

The second symbol is the rising sun. The **rising sun** is the symbol for progress in agriculture. It reminds FFA members and others that every day, agriculture is changing. The changes create a need to keep moving forward by developing new techniques and new technologies. The National FFA Organization is also always progressing and looking to the future needs of its members. The rising sun stands for that progress and the promise that tomorrow will be a new day and have new opportunities.

The third symbol is the plow. The **plow** is the symbol for labor and tillage of the soil. Just as the nation’s founders did, FFA members and workers in agriculture put hard work into everything they do. The plow represents the hard work that is put into all the tasks they complete.

The fourth symbol is the eagle. The **eagle** is the symbol for freedom and the national scope of FFA. It is a national symbol that reminds all FFA members of the freedom in this country to enjoy many things. The eagle is also a reminder of the freedom to choose what you want to explore and pursue both in life and in agriculture.

The fifth symbol is the owl. The **owl** is the symbol for knowledge and wisdom. It has symbolized knowledge and wisdom for a long time. In FFA the owl represents the knowledge and wisdom needed to keep moving forward and to be successful in the agriculture industry.

The term “Agricultural Education” and the name “FFA” complete the emblem. These represent the need for learning and leadership, both of which are required for agriculture to continue and advance. Originally “Vocational Agriculture”

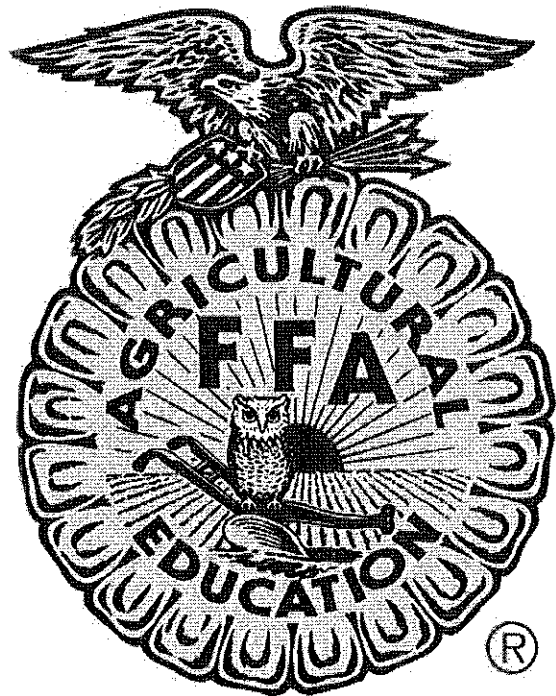


FIGURE 1. The FFA emblem. (Courtesy, National FFA Organization)



FURTHER EXPLORATION...

ONLINE CONNECTION:

Comparing the FFA emblem with the NFA emblem

In 1965 the New Farmers of America (NFA) merged with the Future Farmers of America to become one united organization, which in 1988 was officially renamed the National FFA Organization. The FFA emblem is similar in many ways to the NFA emblem. Go online, and find a picture of the NFA emblem. Compare it with today's FFA emblem. What is the same? What is different? Why do you think the parts that are the same were important enough to keep in the emblem of the merged organization?

appeared on the emblem instead of "Agricultural Education." The word "vocational" means "relating to job or career skills." Although everything one learns in an agriculture class directly relates to a job or career, the National FFA Organization thought that "Agricultural Education" rather than "Vocational Agriculture" would better define the organization and be more recognizable.

FFA Official Dress

Many schools and organizations have uniforms. A uniform makes students or members look like one unit or a team. This is what FFA Official Dress does for FFA members across the nation. **Official Dress** is the uniform FFA members wear. When you zip up the blue jacket to top off your Official Dress, you are representing the largest student-run organization in the United States. The FFA Official Dress makes the playing field level for everyone who walks into a Career Development Event. The components of Official Dress are different for male and female members.

FFA OFFICIAL DRESS FOR MALE MEMBERS

FFA Official Dress for male members consists of the official FFA jacket, black slacks, a white collared shirt, the official FFA tie, black socks, black dress



FIGURE 2. These FFA members are wearing Official Dress.

shoes, and a degree chain with a State or American FFA Degree. The jacket should be zipped all the way to the top. The white collared shirt should be buttoned all the way to the top. Jeans should not be worn in place of black slacks. Boots or athletic shoes are not acceptable

FFA OFFICIAL DRESS FOR FEMALE MEMBERS

FFA Official Dress for female members consists of the official FFA jacket, a black skirt (black slacks for some occasions), a white collared blouse, the official FFA blue scarf, black nylon hosiery, black shoes with closed heel and toe, and a degree chain with a State or American FFA Degree. The jacket should be zipped all the way to the top. The white collared blouse should be buttoned all the way to the top. The skirt should be a plain A-line skirt that is knee length. No slit in the skirt should be higher than 2 inches above the knee. Black slacks may be worn for traveling and outdoor activities.

Do's and Don'ts of the FFA Jacket

The FFA jacket helps create a connection between the 600,000 FFA members across the nation! When you wear this jacket, you are representing the local chapter, the state association, and the national organization. Although there are many events at which the FFA jacket can be worn with pride, it should not be worn everywhere. A few guidelines should be followed as to where to wear the jacket, how to wear it, what to put on it and not to put on it, and how to act when representing FFA.

WHERE TO WEAR THE JACKET

Many CDEs require the wearing of Official Dress. Your FFA advisor can offer guidance on whether Official Dress should be worn for a particular CDE. Many state conventions will require Official Dress anytime you want to attend a session or workshop. If you are privileged enough to attend the National FFA Convention, you will be wearing Official Dress most of the time.

HOW TO WEAR THE JACKET

The jacket should be worn with complete Official Dress; wearing just partial Official Dress is never proper. Only FFA members get the privilege of wearing the FFA jacket. The jacket should be zipped all the way up, the collar kept down, and the cuffs kept buttoned.

HOW TO DISPLAY DEGREE, OFFICE, AND AWARD PINS

A maximum of three pins may be worn on the front of the FFA jacket: degree, office, and award. These pins should be worn beneath your name on the right side of the jacket. The

highest degree earned should be first. The highest office held (or current office) should be second. The highest award received should be third. An exception is that a single State FFA Degree charm or American FFA Degree key should be worn above your name or attached to a key chain.

You should not put your school letters or the insignia of any other organization on your jacket.

HOW TO ACT WHEN REPRESENTING FFA

When wearing the official FFA jacket, always act professionally. Refrain from the use of tobacco and alcohol. Act with respect and as leaders.

Summary:



The National FFA Organization has symbols, traditions, and statements that reflect the past, present, and future direction of the organization. These reveal the proud heritage and bright future of agriculture, agricultural education, and FFA. By understanding these symbols, traditions, and statements, you can appreciate the heritage and the future you represent as an FFA member.

Checking Your Knowledge:



1. What are the official FFA colors?
2. What are the five symbols on the FFA emblem, and what do they represent? What else is on the emblem besides the five symbols?
3. What makes up FFA Official Dress for male members?
4. What makes up FFA Official Dress for female members?
5. How are awards and pins properly displayed on the FFA jacket?

Expanding Your Knowledge:



Visit <https://www.ffa.org>, and explore the areas relating to FFA colors, emblem, and history.

Web Link:



Official FFA Manual

<https://www.ffa.org/SiteCollectionDocuments/officialffamanual-english.pdf>