

The Web Page

► by **Angie Denton**, director of Web marketing

Digital vs. Film: The debate continues

The debate continues among amateur and professional photographers alike: Can digital cameras produce the same quality of image that a 35mm camera can?

There are lots of reasons to support the purchase of either format. The determining factor should be based on the intended use of your images. If you are shooting photos to post on a Web site or to share with friends and family via e-mail, a digital camera is a logical choice. If you want an 8x10-inch (in.) or larger print, or if you intend to use the photo for print advertising, a good 35mm camera and print film is a logical choice.

Digital gaining popularity

Digital cameras have come a long way in recent years. Prices are down. Resolution and, therefore, image quality, are up. There are some high-end, consumer-level digital cameras that can produce images of acceptable size to print in a magazine or as an 8x10 photo, but they can be a significant investment.

As cattle producers, your goal as a photographer may be to create images to post to your Web site or to e-mail to potential customers. Or, you may want to capture images for advertising purposes, such as an *Angus Journal* advertisement.

“The biggest advantage of digital is that results can be determined almost immediately,” says Tom Perrier of Dalebanks Angus, Eureka, Kan. “Twenty to 30 shots can be taken of an animal with only the best saved. Using 35mm, it would take one to two rolls and, even with one-day processing, it could be two days before the results are known.”

We realize that the use of digital cameras to take photos used in Angus advertisements will continue to increase. Several professional cattle photographers have switched to digital. Here at Angus Productions Inc. (API), we use a professional-level digital camera to take the color show photos that we offer for sale and publish in the *Angus Journal*.

Still, many of the digital images we receive at API for use in the *Angus Journal* or the *Angus Beef Bulletin* are not of the quality needed for satisfactory reproduction in the magazine. If your goal is to use a digital image for publication in the *Angus Journal* or another publication, your satisfaction with the end result will depend on buying adequate equipment and learning how to properly save and deliver the image to the publication.

The following article discusses digital cameras and what is available today. As with any new technology, digital cameras will continue to advance. It would be difficult to recommend a camera that would fit everyone’s needs. This story is meant only to provide information for you to consider — not to suggest what must be used in every situation. If you have specific questions, drop us an e-mail at webmarketing@angusjournal.com. For more information about digital cameras see the August 2001 “Web Page,” or visit the Web sites listed in Table 1.

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What is a digital camera?

A digital camera is not only the tool used to focus the image, but also the device that records it. It serves both as camera and film.

With a film camera, you aim at a subject and press a shutter button. The shutter inside the camera lens opens to expose light to film inside, capturing the image onto the film. You fill up the roll of film, take it to a lab for developing and get photos or slides returned.

With a digital camera, you aim at a subject and press a shutter button. The shutter inside the camera lens opens to expose light to a small sensor inside, capturing the image onto a storage medium instead of film. You fill it up, then transfer your images to your computer, from which you can alter, print or e-mail them.

There are all kinds of digital cameras on the market today. *Digital Photography Review* has a

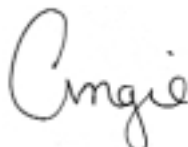
digital camera comparison engine on its Web site at www.dppreview.com/reviews/compare.asp, which allows you to sort cameras that meet your buying criteria. Some of the more important features to consider are price, maximum resolution, optical zoom, manual focus option, flash options, storage types, image format options and camera weight.

The quality of a digital image, whether printed or displayed on a screen, depends in part on its resolution — the number of pixels (short for picture elements) used to create the image. The greater the number of pixels, the higher the resolution and the greater the detail and sharpness of the image.

When purchasing a digital camera, it is important to know the size and quality of images it will be capable of taking. This is found by examining megapixel options. Megapixel refers to the maximum number of pixels that a camera will take on the highest quality setting (see Table 2, page 204, for megapixel comparisons).

Table 1: Digital camera Web resources

www.steves-digicams.com/digi_dictionary.html
www.dppreview.com
www.shortcourses.com/index.htm
www.digitalcamerabasics.com



E-MAIL: adenton@angusjournal.com

CONTINUED ON PAGE 204

Table 2: Calculating the maximum acceptable image size for home printer and publication based on the digital file size captured based on camera resolution

Minimum megapixel, in.	Digital file size, ^a in. at 266 dpi)	Photo printer print size, pixels at 72 dpi	AJ/ABB ^b print size, in.
1.3	640 x 480	4 x 6	1.805 x 2.407
2	1,280 x 960	5 x 7	3.608 x 4.811
3	1,600 x 1,200	8 x 10	4.511 x 6.015
4	2,048 x 1,536	Cropped 8 x 10	5.775 x 7.7
5	2,560 x 1,920	11 x 14	7.218 x 9.624

^aMinimum number of pixels for desired photo prints. This is with *no* cropping.

^bAngus Journal or Angus Beef Bulletin.



An “x” megapixel camera set at its highest resolution size will capture images at the biggest size possible. Pictured on the left is a representation of the printable size differences you will see between cameras. See Table 2 for comparisons between a photo printer and publication printing.

The more megapixels you have, the larger both the physical size and the file size of the photo will be. Photos need to be of higher quality to be printed at larger sizes. A regular 35mm negative image is equivalent to a 10 or more megapixel digital image. The advantages of having a high number of pixels are twofold: (1) The more pixels you have, the better print quality you'll have, especially at larger sizes, and (2) The more pixels you have, the more flexibility you will have in cropping.

A regular 35mm negative image is equivalent to a 10 or more megapixel digital image.

Dean Houghton, 2001 American Agricultural Editors' Association (AAEA) Photographer of the Year, uses both print and digital format cameras. Digitally, he uses a Nikon 990 on the highest image quality setting.

Houghton recommends a 3-megapixel camera or better. "I would not recommend spending the money on a professional or semiprofessional camera body for most people," he says. "The price is simply too high for the small additional benefit in performance."

After a digital camera captures an image it stores it on a storage medium like a SmartMedia™, CompactFlash™, Memory Stick™ or Microdrive. Just like with the digital camera, there are many options with digital media, including storage space, speed and size.

"Use the best CompactFlash or other memory card you can afford," Houghton suggests. He uses a 256-megabyte (MB) card with 24x speed.

"Remember that for every \$1 you spend for a digital camera, you probably will spend \$2 on memory cards, a better printer, a larger hard drive plus a CD burner to store, record and preserve the images," Houghton adds.

Although the initial investment for a digital camera is more than for a film camera, the savings throughout the life of the camera can make up for the difference. According to www.digitalcamerabasics.com you can expect to pay about 2.5 to 3 times more for a digital camera compared to a similar film counterpart. In other words, a very basic film camera might cost \$50 to \$75, and a very basic digital camera will cost \$150 to \$225.

Cattle photographer John Goggins switched to 100% digital in 2000. "I

switched because I was spending \$8,000 to \$10,000 per year in film and processing at camera shops. The body of my camera was a little more than \$5,000 (at that time), and I could still use my same lenses that I was using on my Nikon 35mm negative camera," Goggins explains.

Knowing your camera

All great images, digital or otherwise, start by capturing a great photo. And capturing great photos requires an understanding of your camera. An important section to read in your camera's manual is the chapter(s) on image quality,

image size and compression (compressing the file to a smaller storage size).

Unlike film cameras, most digital cameras have three photo quality options. The camera can be set for different recording formats — standard quality, high quality and super high quality (this varies among brands so be sure to read the manual). There are also compression options.

With digital cameras there is a tradeoff between compression and image quality. Less compression, sometimes called "Fine" mode, gives you better images so you can make larger prints, but you can't store as many images.

CONTINUED ON PAGE 206

Let's talk digital

Digital cost advantages:

- 📷 No film to buy.
- 📷 No processing costs.
- 📷 No wasted film or unusable prints.
- 📷 You can try numerous angles, exposures, etc., and erase the ones you don't want, instead of spending \$10 and up for a roll of 35mm film with processing. You upload your results to your computer, and you can have an instant slide show to review your results.
- 📷 Cost of memory cards has plummeted, while capacity keeps getting greater.



Digital convenience advantages:

- 📷 Instant results. You know immediately if the picture is worth saving. If it's not, you can delete it and try again.
- 📷 No trips to the photofinisher.
- 📷 Images are in digital form right out of the camera, so no scanning is needed.
- 📷 Images can be indexed and archived on CD.
- 📷 Reusable media. Medium is stable without refrigeration and will last indefinitely.
- 📷 No bulky rolls of film to carry around.

Digital disadvantages:

- 📷 Digital cameras are more expensive, feature for feature, than film cameras.
- 📷 Digital cameras become obsolete much faster than film cameras.
- 📷 Battery life is short if you use the LCD screen.
- 📷 There is probably no digital camera that is as easy to use as a film-based point-and-shoot camera.
- 📷 If you are scared of technology, you probably should stay with film. If you are not very comfortable with adding hardware and software to your computer and don't have anyone to help you, you may want to consider this when selecting a camera.
- 📷 A digital image does not carry as much information as fine-grain film, so you cannot crop as deeply into the image and still have enough resolution for large prints.
- 📷 The time for digital cameras to process the image before capturing another image in comparison is typically longer than a typical 35mm camera.

▶ THE WEB PAGE

CONTINUED FROM PAGE 205

More compression, in modes such as “Normal” or “Basic,” lets you store more images and makes the images more handy for making smaller prints on your home printer, posting on a Web page or sending as e-mail attachments. Using this setting, however, does not produce high-quality prints. For the highest resolution, some cameras offer an uncompressed format.

The resolution you need in an image increases as the size that you want to print it

increases. “Use the highest settings available on your camera,” Houghton suggests. Although it takes up more space on your storage media, the quality is much better.

The more pixels in an image, the sharper the picture will be. You can also cut out (or “crop”) portions of the frame from higher-resolution photos with most photo-editing software. This will allow you to get smaller photo-quality prints out of a larger picture. Remember that high-resolution photos will

take up more space on your memory card and your hard drive. Consider what you’ll be using your camera for, and pick the best resolution for your needs.

Save in the correct format

The most common digital image format is JPEG, which stands for Joint Photographic Experts Group, the original name of the committee that wrote the

CONTINUED ON PAGE 208



▶ Sending low-resolution or small digital images to API for advertising purposes can lead to poor image quality or pixelization. This image is an example of a file submitted for an *Angus Journal* ad. The small image (right) is the maximum size it should be printed in the *Journal*. Above is the photo at the requested size. Note that you can see the individual pixels. Pixels are the most important factor in determining the quality of your digital photograph. Digital photographs are made up of hundreds of thousands or millions of tiny squares called pixels (picture elements). A pixel is given size and shape by the device that prints or displays the image.



Working with digital photos

Always archive raw images on either a CD or other storage medium before opening or saving as. Do not save as, just duplicate the image. After the image has been edited and prepped you should store the final image as well (see examples in Fig. 1).

Remember, recompressing an altered image loses more information. Hence it's important to minimize the number of generations of JPEG compression between initial and final versions of an image. Use a lossless TIFF format while working on the image, then convert it to a JPEG when you are ready to file it away or send it out on the 'Net. Below is a list of tips/steps to follow if you decide to use a digital camera.

Some cameras come with software that allows you to choose different format options such as to e-mail and to print. To learn more about the software that came with your camera read your owner's manual. The steps described below assume you are using a photo-editing software packages such as Adobe PhotoShop or Microsoft Photo Editor.

Sending to API:

For the best reproduction, send your raw file to Angus Productions Inc. (API) before any editing or manipulation is done. This will allow the API staff to optimize, size and color-correct your photo to get the best results possible. Note: we can't make an image any better than what it is — you can't add pixels if the data is not there.

Mail API the flash card or digital media with the unaltered original file. Be sure to duplicate the card or media before mailing the original (see Fig. 1).

If you prefer not to send the flash card you can burn the image to CD or duplicate to a ZIP disk. Again, don't open and save, just copy the image.

If you want to e-mail the file, do not open and size it down. Use "ZIP" or "Stuffit" to compress the file size.

Another option is posting the image to the API FTP site. For details, contact our office.

Don't print out a copy of your file on your home printer and send it to us. Image quality would be lost if we were to scan a printout of a digital image. In essence you'd be scanning a second-generation image, and image detail is lost with each generation.

To e-mail to friends, customers:

Open image.

Color-correct, lighten and sharpen your image (if needed).

Image size photo to 4x6 at 72 dpi. The smaller width and height you make the image, the faster it will be to e-mail.

"Save As" image with new name as a JPEG. Be sure not to use special characters when naming and to remove all spacing.

Open e-mail program, and start new message.

Using the attach option (paperclip icon in most e-mail programs), browse and find your image, and attach it to your message.

Address the message, and include any text you also want to send.

Send it for friends and family to enjoy.

To print on photo printer:

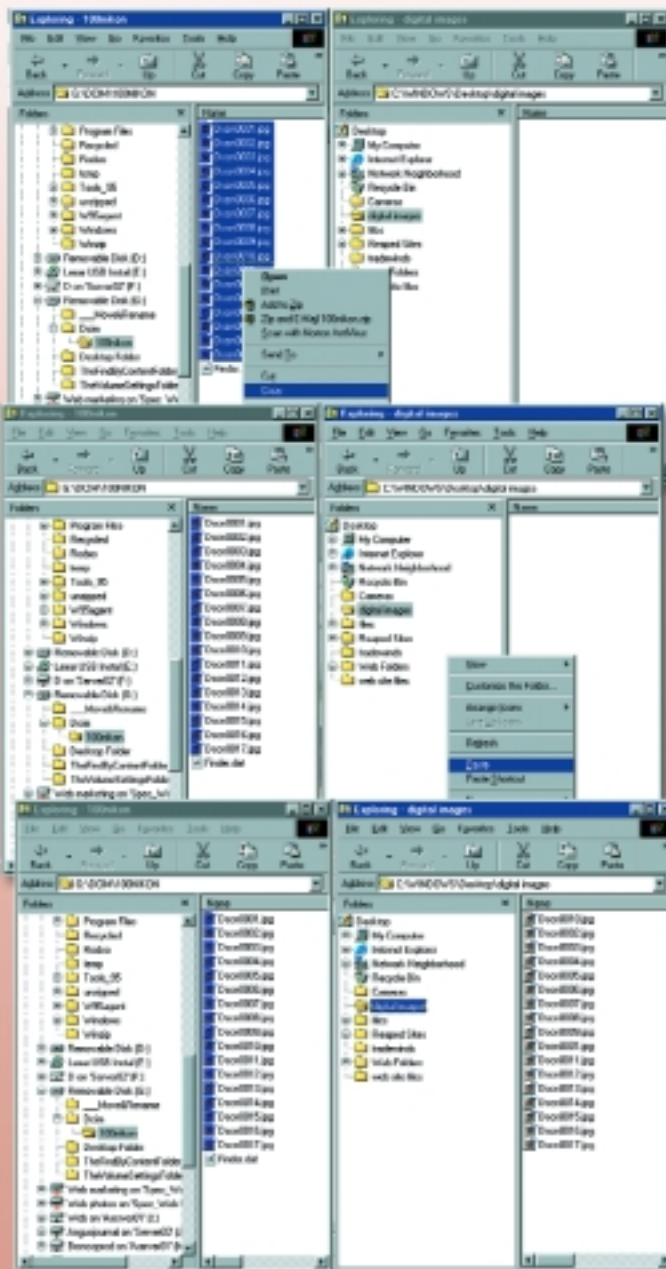
Open image.

Color-correct, lighten and sharpen your image (if needed).

Crop and size photo to desired dimensions (for printing purposes you want the resolution to be 300 dpi.).

Some photo-editing software programs have photo-printing package options that you can select and it will format the pictures for you. For example if you want a 4x6 and a 5x7 you select that package and it will do the work and put it on a new canvas for you to print with both images on the same page.

Fig. 1: One of the easiest ways to make a backup of your FlashCard or other digital storage media is by using your Windows Explorer (for PC users). Open two Explorer windows. One with your original images and then make a new window with the folder where you want to save your backup. In the example below the original files are in a folder on the left titled 100nikon. Highlight all of the images on the left and select "copy." Move your mouse to the new, open folder (second screen shot), right click and select paste. In the final screen shot you'll see the original raw files on the left and a copy on the right. You can repeat this process to have another copy to edit on your hard drive (set up an edit folder and back-up/original folder).



If you don't have a computer, you can buy a photo printer with a FlashCard reader that allows you to print directly from the FlashCard. You can also take your card to a photo processor who has the capabilities of printing from your digital medium.

standard. It is used to make large image files smaller and more manageable by discarding unnecessary information. The only other common alternative is TIFF; this produces a larger, uncompressed file.

JPEG is a “lossy” format, meaning that the decompressed image isn’t quite the same as the one you started with. JPEG is designed to exploit known limitations of

the human eye, notably the fact that small color changes are perceived less accurately than small changes in brightness.

The real disadvantage of lossy compression is that you lose image quality each time you compress an image.

Even professional cameras will have a JPEG mode, and, despite its lossy compression, it has become the standard image format for electronic storage of photographic images. The reason for this is the compression algorithm’s ability to reduce an image file size by 8- or 10-to-1 without any degradation in image quality to the human eye at normal viewing magnification. A 1.5-MB, 3-megapixel JPEG image will be hard to distinguish from the same image saved as a lossless TIFF weighing in at 9.2 MB. But, if the image is run through a press printer, such as what’s used to print the *Angus Journal*, a noticeable difference can be seen in photo quality.

When editing an image in several sessions, it is recommended to save the intermediate image in an uncompressed format (TIFF or BMP) to avoid the accumulation of JPEG losses. The losses occur in the image’s quality because the JPEG format continues to compress the image. So only compress (save as a JPEG) after all editing is done. If you expect to edit your image again in the future, keep a lossless master copy to work from. The JPEG you put up on your Web site should be a derived copy, not your editing master.

Another file format option is RAW. This is simply the raw data collected; no in-camera processing is performed. The advantage being that a RAW file is lossless, but the size

is considerably smaller than a TIFF file. The image has not been processed, sharpened or white balanced, which means you can correct the image, and it’s a better representation of the “digital negative” captured. The disadvantage is you can’t open these image files with a normal photo package without using an “acquire module” (a plug-in, typically TWAIN, which can open/process such images; most upper-end cameras come with the acquire software). There is not a

universal RAW format that is common among all camera brands. Each make is different, which can lead to confusion among consumers.

Optical vs. digital zoom

When taking photographs, especially of cattle, it’s nice to be able to get closer without having to move physically closer to the subject. To do this you must have a camera with a zoom, but be careful not to confuse *digital* zoom with *optical* zoom.

According to www.digitalcamerabasics.com, digital zoom is not worth having. They recommend not allowing it to affect your purchase decisions. A digital zoom simply takes the center of the photo and digitally enlarges it. The image quality suffers and lacks detail, and you don’t have a true zoom photo.

Optical zoom is a real zoom, which works much like binoculars or a small telescope, where the camera moves the lens back and forth to bring the subject you’re aiming at closer.

Many cameras have an optical zoom and a digital zoom and will use this to try to make their camera sound as if its zoom is larger than it is. For example, a camera may have a 3X optical zoom and a 2X digital zoom in the camera, and the maker advertises it as “Comes with a 6X zoom.”

Another thing to remember is what a real zoom is; a “2X” optical zoom is just barely greater than what

you would see with your naked eye. It’s not really a “zoom,” so to speak. Many cameras have a 3X optical zoom, which will bring you a bit closer to the subject. But if you want to take photos of cattle, distant scenic shots, and so on, you’ll need to spend more money and find cameras that offer 5X through 10X optical zooms.

Perrier uses an Olympus C-2020 Z digital camera to take photos for his sale book and advertising. It is a 2.1 megapixel with 3X zoom. “It takes very good pictures,” Perrier explains. “Sometimes I’ve thought they were better than the 35mm shots taken at the same time and place.”

The team of Browarny Digital switched to 100% digital in January 2001. Browarny is a Canada-based company that does a lot of cattle photography. They are the official photographers of the National Western Stock Show (NWSS) and have several field representatives in the United States.

Jeff Koch, one of Browarny’s U.S. field representatives says to get good images you need a good lens and large pixel files. They use Nikon D1s and D100s.

Before you buy a camera, do your research, just like you do before you purchase a herd sire. Find a camera that fits

your needs. Take the time to visit with others who have used digital cameras. Some companies will even let you rent or borrow a camera to test it before purchasing.

The old adage that a picture is worth a thousand words is still true today. It is important to remember, however, that having no picture in an advertisement is better than having a bad picture. Be sure the quality of photo you are getting is what you want to

represent your breeding program.



After opening an image, save it as a TIFF file. Each time you save a file as a JPEG it creates more artifacts.

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