The effect of high altitude on nitrogen is essentially the same as it would be for air, since altitude affects all gases in a similar manner. If you filled a tire with nitrogen at sea level, then took that same tire to 8000 feet (assuming the air temperature was the same), the tire would read about 3.8 psi higher on the tire gauge. The tire pressure would also return to its original level if you then took that tire back to sea level (again assuming the air temperature was the same). So, in your case, the pressure in your tires would increase somewhere around 1.7psi.

The pressure in nitrogen-filled tires will also change when the temperature changes, just as it does with air-filled tires, because nitrogen responds to changes in ambient temperature in a similar manner to oxygen. For example, when your vehicle is parked it will lose a similar amount of pressure for every 10 degree change in temperature, whether the tires are filled with nitrogen or air. The calculations for this change are based on the Ideal Gas Law. A good rule of thumb is, for every 10°F change in temperature, the pressure will change by 1.9%. For example; if a tire is filled to 32 psi at a temperature of 75°F and the temperature drops 10 degrees, the tire pressure will drop to 31.4 psi; a difference of .6 psi. If a 100 psi tire is filled at 75°F and the temperature drops 10 degrees, the tire pressure will drop to 98.1 psi; a difference of 1.9 psi. These fluctuations will occur as the temperature rises and falls no matter what the inflation gas. Fortunately, tire manufacturers are well aware of these conditions and design their tires and recommend their cold inflation pressures accordingly.

However, as you drive and the tires heat up, nitrogen does not contain the moisture and other contaminants found in compressed air, so nitrogen-filled tires will fluctuate less in temperature and pressure than air-filled tires while driving. The bottom line is, you will still see pressure changes with nitrogen, but overall your tires will run cooler and at a more consistent pressure than if they were filled with air.